

MANUAL TRANSMISSION

MT

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MANUAL TRANSMISSION > General Description

CAUTION

- When performing service operation, refer to "Repair Contents" in "General Description".  [Ref. to REPAIR CONTENTS>Repair Contents.](#)
- Prior to starting work, pay special attention to the following:
 1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
 2. Protect the vehicle using a seat cover, fender cover, etc.
 3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Prevent scattering of grease and oil. If it scatters, wipe it off immediately to prevent it from penetrating the floor or flowing out, to protect the environmental.
- If the grease and oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary work.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground terminal from the battery sensor.
- Always use the jack-up point when the lifting device, shop jacks or rigid racks are used to support the vehicle.
- Before starting works, remove dirt and corrosion around the target area.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- For the parts except for the non-reusable parts, replace them with new parts if necessary.
- Be sure to tighten bolts and nuts to the specified torque.
- Always use new application oil during work.
- Always remove or install the transmission body in an area where lifting devices, transmission jacks, etc. are available for ready use.

MANUAL TRANSMISSION > General Description**SPECIFICATION****1. MANUAL TRANSMISSION**

Model	2.4 L	
Type	6-forward speeds and 1-reverse with synchromesh	
Transmission gear ratio	1st	3.626
	2nd	2.189
	3rd	1.541
	4th	1.213
	5th	1.000
	6th	0.767
	Rev.	3.438

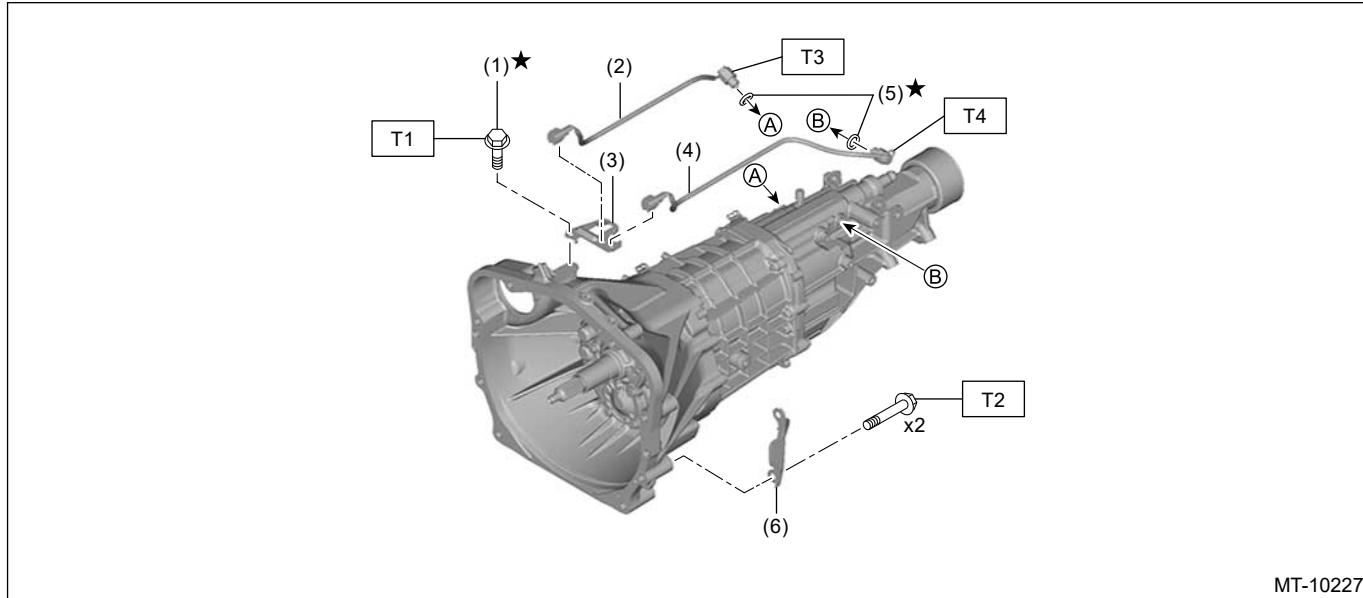
2. TRANSMISSION GEAR OIL**Caution:****Do not mix different kinds of oil.****Note:****Using any materials other than recommended may result in abnormal noise, vibration, functional decline, or poor fuel economy.**

Recommended and alternative materials	Capacity
<ul style="list-style-type: none"> Recommended materials: Manual transmission gear oil LV 75W 	L (US qt, Imp qt)
<ul style="list-style-type: none"> Alternative materials: API standard GL-4 (75W) 	2.2 (2.3, 1.9)

MANUAL TRANSMISSION > General Description

COMPONENT

1. SWITCH AND HARNESS



- (1) Bolt
- (2) Back-up light switch
- (3) Harness bracket
- (4) Neutral position switch
- (5) Gasket
- (6) Cover plate

Tightening torque: N·m (kgf·m, ft-lb)

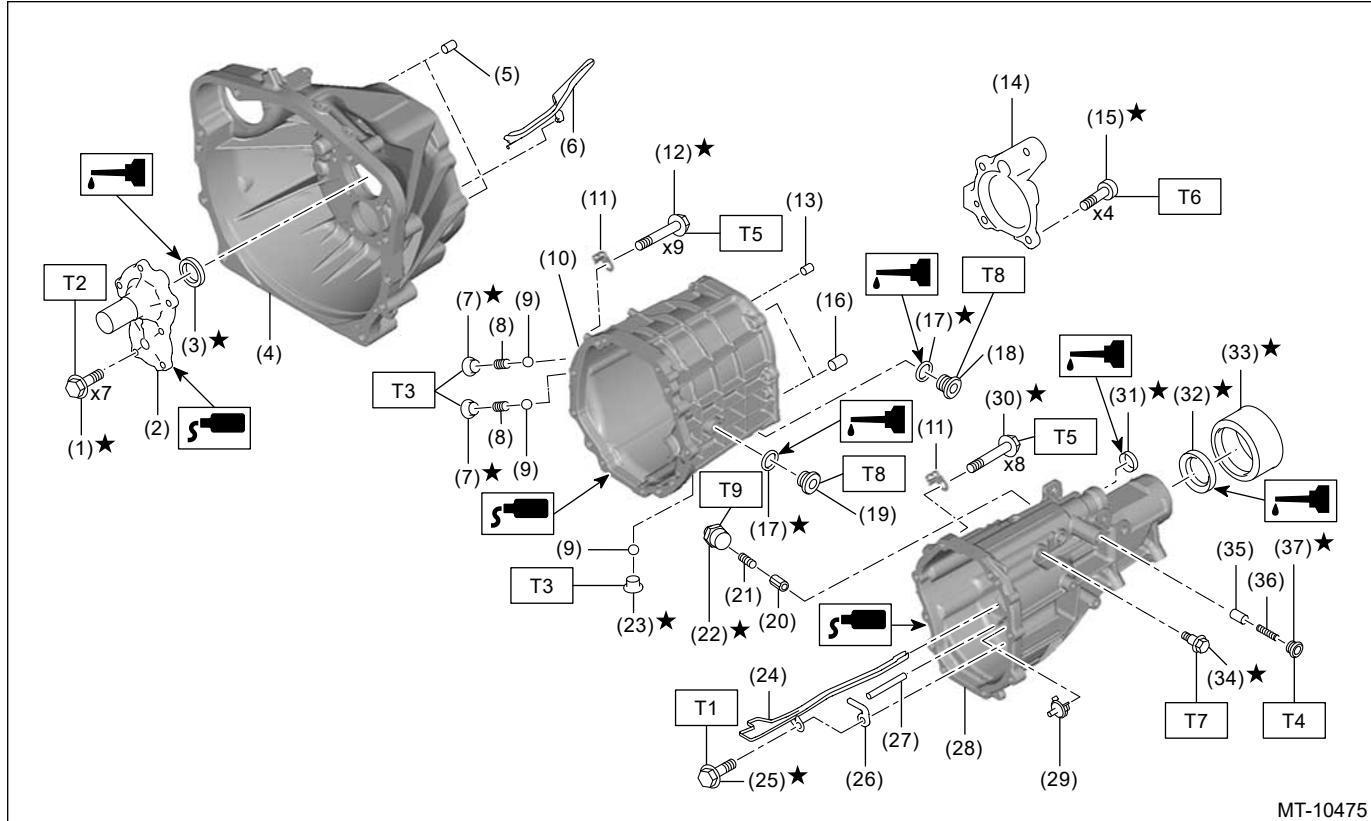
T1: 7 (0.7, 5.2)

T2: 50 (5.1, 36.9)

T3: [Ref. to MANUAL
TRANSMISSION>Switches
and
Harness>INSTALLATION >
BACK-UP LIGHT SWITCH.](#)

T4: [Ref. to MANUAL
TRANSMISSION>Switches
and
Harness>INSTALLATION >
NEUTRAL POSITION
SWITCH.](#)

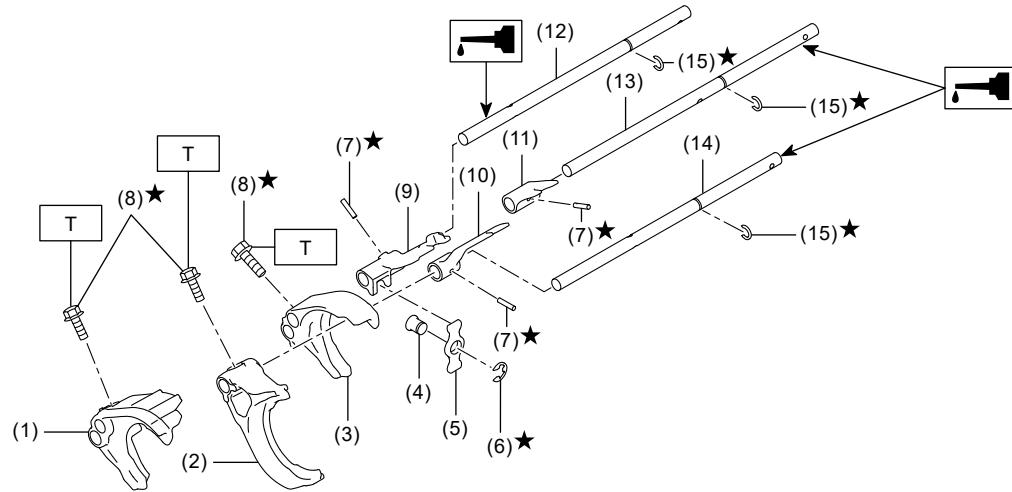
2. TRANSMISSION



MT-10475

(1) Bolt	(17) Gasket	(33) Dust cover
(2) Front bearing retainer	(18) Drain plug	(34) Bolt
(3) Oil seal	(19) Filler plug	(35) Lock ball pin
(4) Clutch housing	(20) Lock ball pin	(36) Compression spring
(5) Knock pin	(21) Compression spring	(37) Head straight screw plug
(6) Oil receiver pipe	(22) Holder	
(7) Head straight screw plug	(23) Head straight screw plug	Tightening torque: N·m (kgf·m, ft-lb)
(8) Spring	(24) Oil guide No. 1	T1: 8.5 (0.9, 6.3)
(9) Ball	(25) Bolt	T2: 17 (1.7, 12.5)
(10) Transmission case	(26) Stopper plate	T3: 19 (1.9, 14.0)
(11) Clamp	(27) Straight pin	T4: 24.5 (2.5, 18.1)
(12) Bolt	(28) Extension case	T5: 29 (3.0, 21.4)
(13) Knock pin	(29) Oil guide No. 2	T6: 30 (3.1, 22.1)
(14) Rear bearing retainer	(30) Bolt	T7: 31 (3.2, 22.9)
(15) Bolt	(31) Oil seal	T8: 37 (3.8, 27.3)
(16) Knock pin	(32) Extension case oil seal	T9: 39.2 (4.0, 28.9)

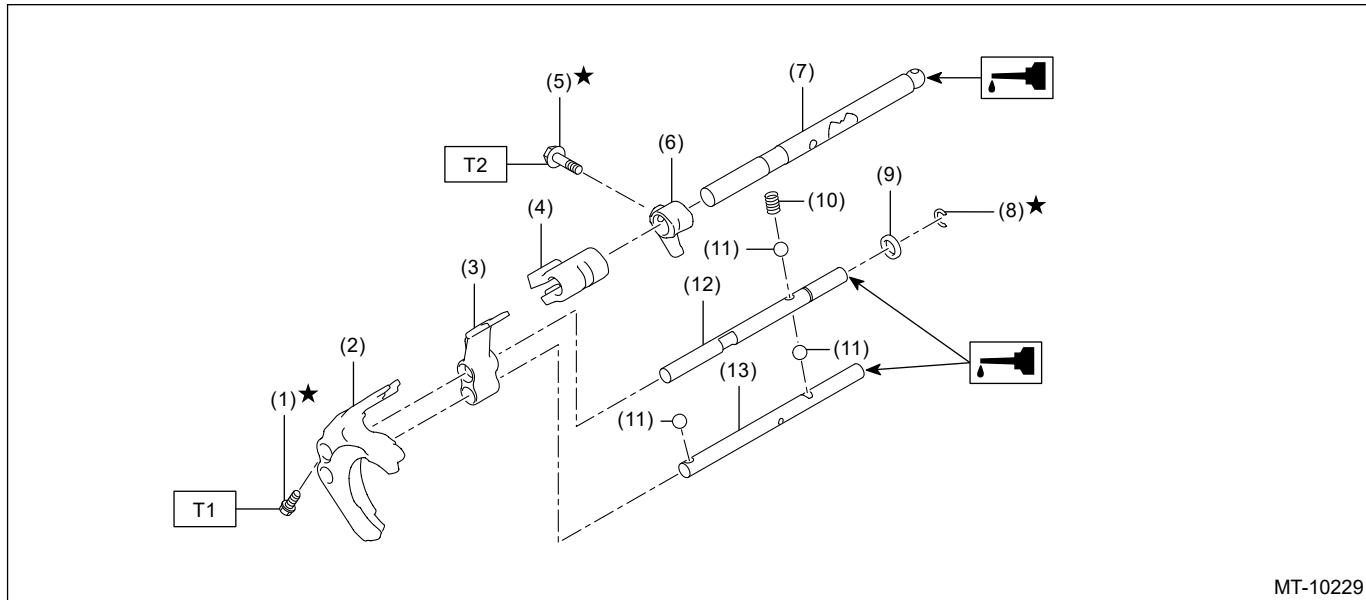
3. SHIFTER FORK AND FORK ROD 1



MT-10230

- | | | |
|---------------------------|--------------------------------|--|
| (1) Gear shift fork No. 3 | (7) Spring pin | (13) Gear shift fork rod No. 2 |
| (2) Gear shift fork No. 2 | (8) Bolt | (14) Gear shift fork rod No. 3 |
| (3) Gear shift fork No. 1 | (9) Gear shift head No. 1 | (15) Snap ring |
| (4) Shift arm pivot | (10) Gear shift head No. 2 | |
| (5) Shift arm | (11) Gear shift head No. 3 | Tightening torque: N·m (kgf·m, ft-lb) |
| (6) E-ring | (12) Gear shift fork rod No. 1 | T: 19.5 (2.0, 14.4) |

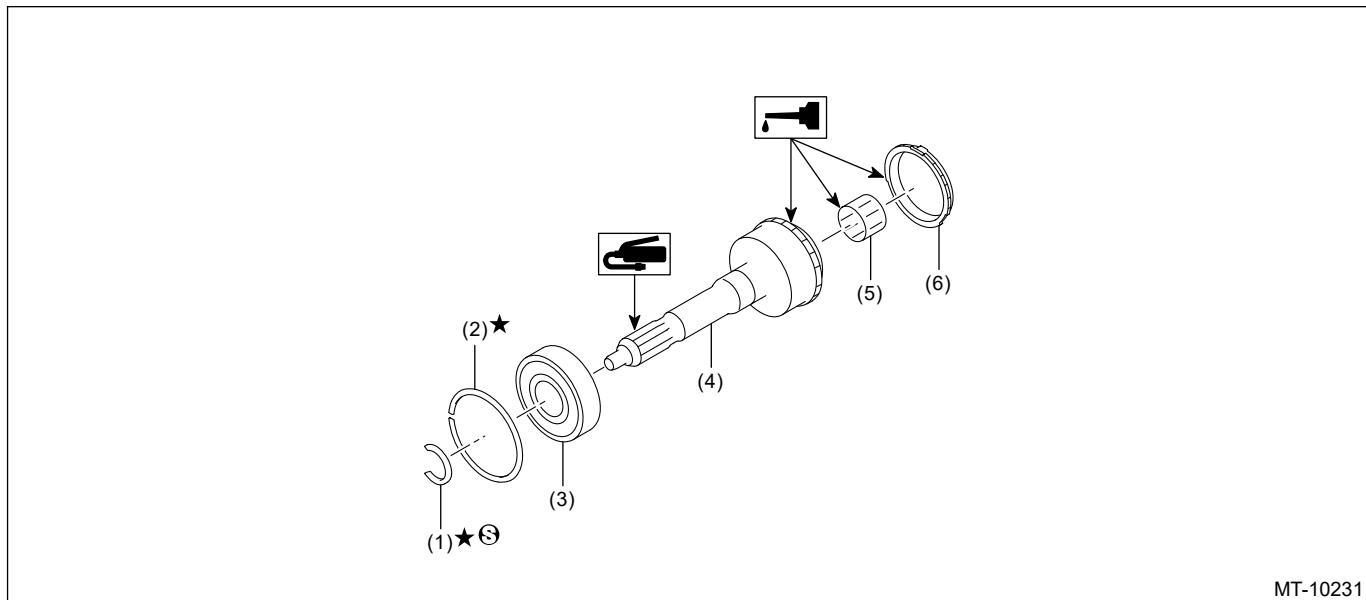
4. SHIFTER FORK AND FORK ROD 2



MT-10229

- | | | |
|---------------------------|--------------------------------|--|
| (1) Bolt | (7) Shift shaft | (13) Gear shift fork rod No. 5 |
| (2) Gear shift fork No. 4 | (8) Snap ring | |
| (3) Gear shift head No. 5 | (9) Washer | Tightening torque: N·m (kgf·m, ft-lb) |
| (4) Shift block | (10) Compression spring | T1: 19.5 (2.0, 14.4) |
| (5) Bolt | (11) Ball | T2: 33.3 (3.4, 24.6) |
| (6) Shift inner lever FR | (12) Gear shift fork rod No. 4 | |

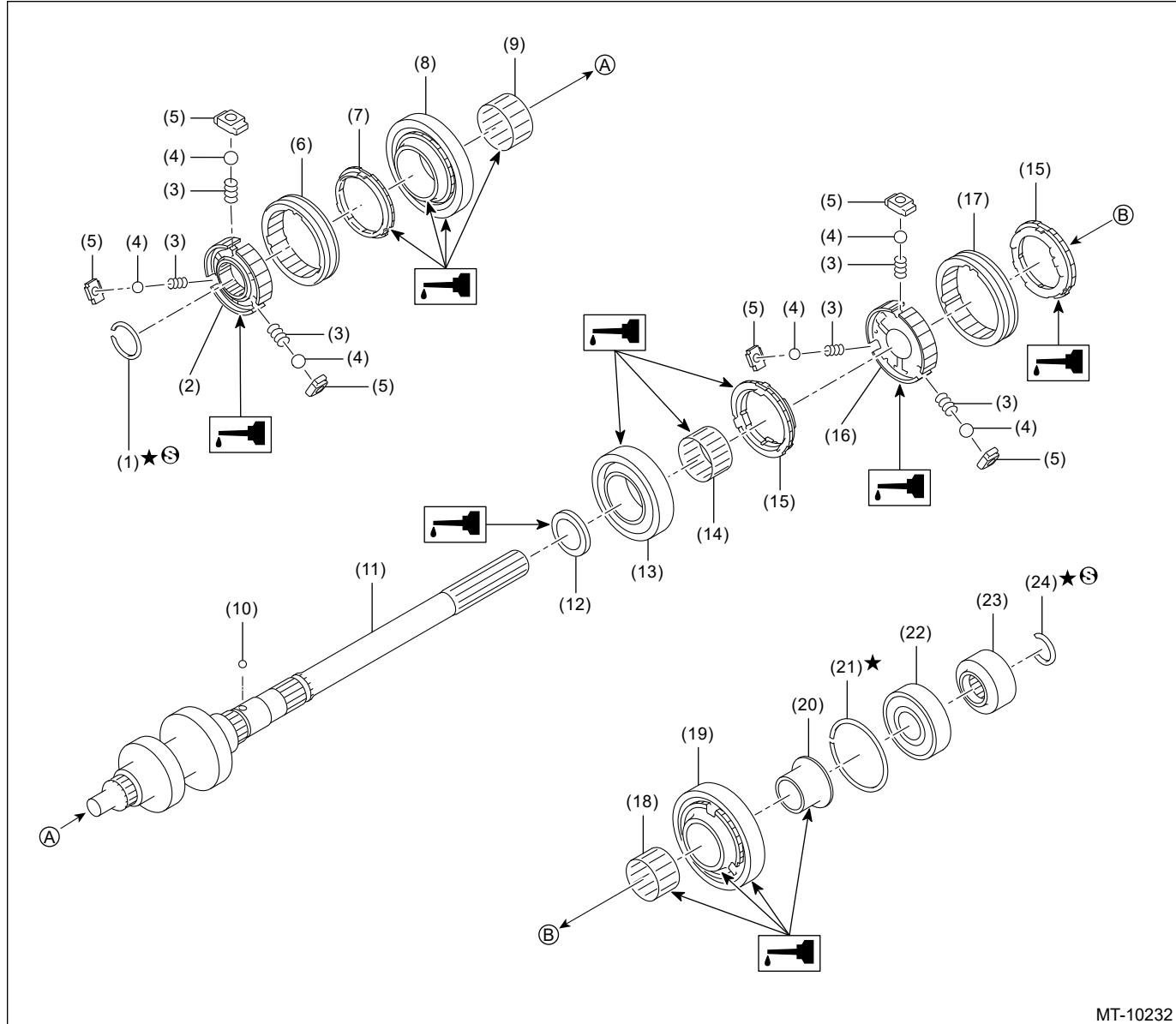
5. INPUT SHAFT



MT-10231

- | | | |
|---------------|-------------------------|-----------------------------|
| (1) Snap ring | (3) Input shaft bearing | (5) Needle roller bearing |
| (2) Snap ring | (4) Input shaft | (6) Synchronizer ring No. 2 |

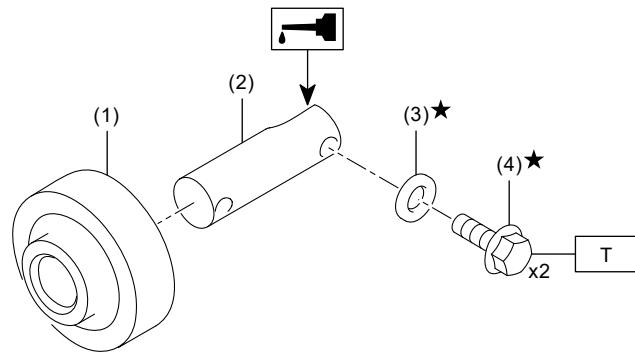
6. OUTPUT SHAFT



MT-10232

- | | | |
|--|-------------------------------------|----------------------------------|
| (1) Snap ring | (9) Reverse gear bearing | (17) Hub sleeve No. 1 |
| (2) Clutch hub No. 3 | (10) 1st shift restrict ball | (18) 1st needle roller bearing |
| (3) Synchromesh shifting key
spring No. 1 | (11) Output shaft | (19) 1st gear |
| (4) Ball | (12) Thrust bearing | (20) 1st gear bearing inner race |
| (5) Synchromesh shifting key No.
1 | (13) 2nd gear | (21) Snap ring |
| (6) Hub sleeve No. 3 | (14) 2nd gear needle roller bearing | (22) Output shaft bearing |
| (7) Synchronizer ring No. 3 | (15) Synchronizer ring set No. 1 | (23) 6th gear |
| (8) Reverse gear | (16) Clutch hub No. 1 | (24) Snap ring |

7. REVERSE IDLER GEAR



MT-10233

(1) Reverse idler gear

(3) Gasket

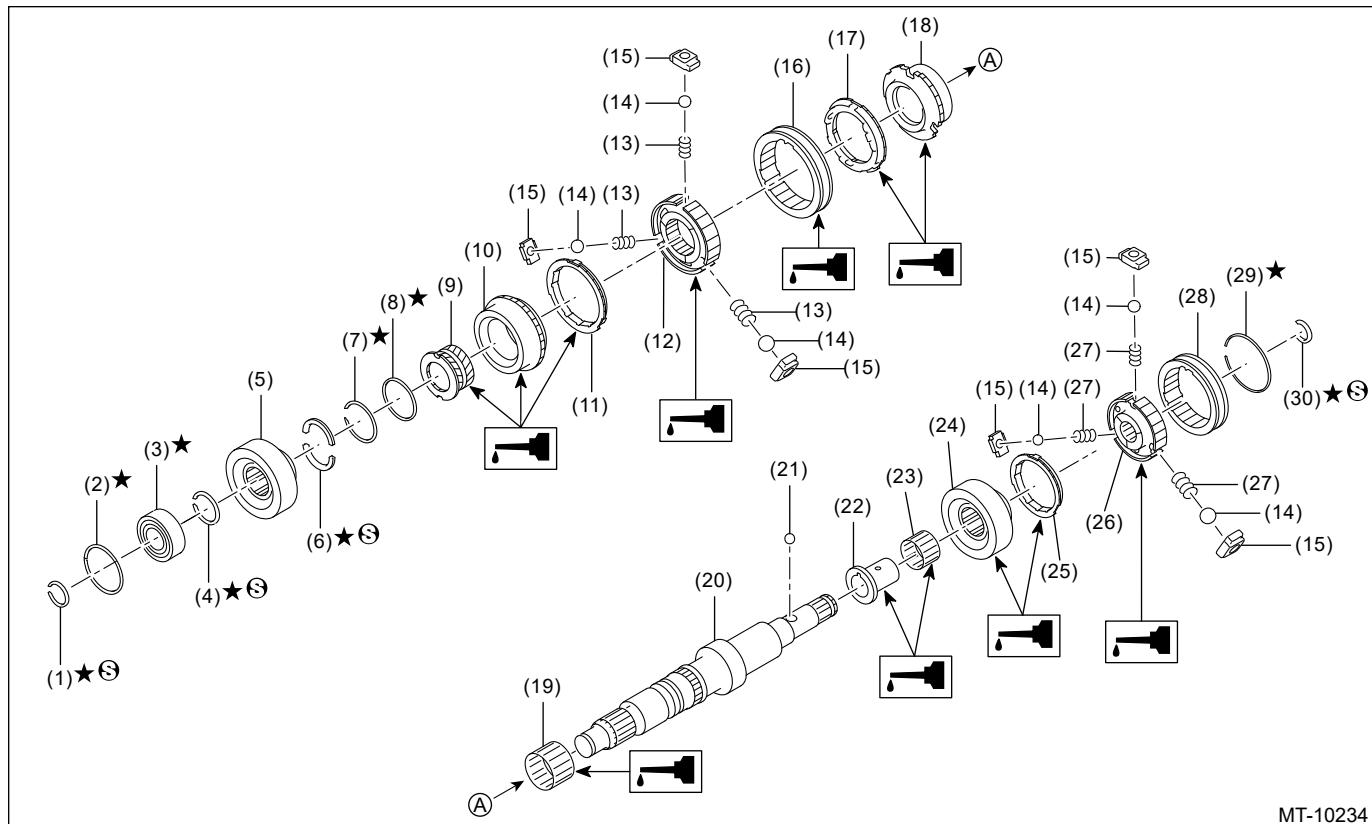
**Tightening torque: N·m (kgf·m,
ft-lb)**

(2) Reverse idler gear shaft

(4) Bolt

T: 28 (2.9, 20.7)

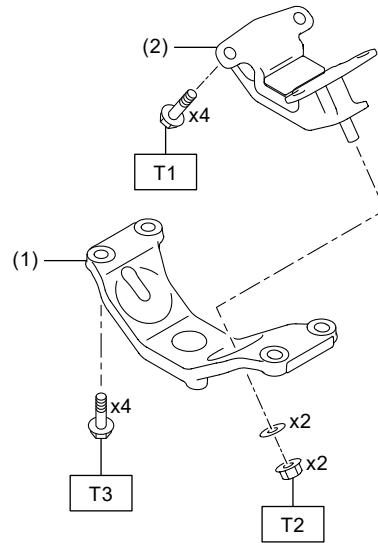
8. COUNTER GEAR



MT-10234

- | | | |
|----------------------------------|---|---|
| (1) Snap ring | (11) Synchronizer ring No. 1 | (21) Ball |
| (2) Snap ring | (12) Clutch hub No. 2 | (22) 6th gear bearing inner race |
| (3) Front bearing | (13) Synchromesh shifting key
spring No. 1 | (23) 6th needle roller bearing |
| (4) Snap ring | (14) Ball | (24) 6th gear |
| (5) Drive gear | (15) Synchromesh shifting key No.
1 | (25) Synchronizer ring No. 2 |
| (6) 4th inner race thrust washer | (16) Hub sleeve No. 2 | (26) Clutch hub No. 4 |
| (7) Snap ring | (17) Synchronizer ring set No. 3 | (27) Synchromesh shifting key
spring No. 1 |
| (8) 4th retaining ring washer | (18) 3rd gear | (28) Hub sleeve No. 4 |
| (9) 4th gear bearing inner race | (19) 3rd gear needle roller bearing | (29) Snap ring |
| (10) 4th gear | (20) Counter shaft | (30) Snap ring |

9. TRANSMISSION MOUNTING



MT-10235

(1) Transmission rear
crossmember

(2) Rear cushion rubber

**Tightening torque: N·m (kgf·m,
ft-lb)**

T1: 40 (4.1, 29.5)

T2: 55 (5.6, 40.6)

T3: 65 (6.6, 47.9)

MANUAL TRANSMISSION > General Description

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

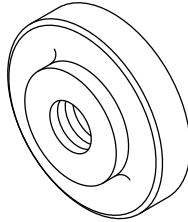
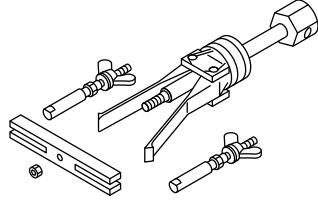
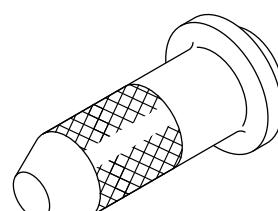
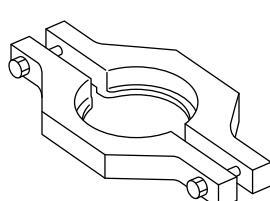
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398477703	398477703	DRIFT 2	<p>Used for installing the clutch hub No. 2.</p> <p>Note: Used together with INSTALLER (18654AA000).</p>
 ST-398527700	398527700	PULLER ASSY	Used for removing the extension case oil seal.
 ST-498057300	498057300	INSTALLER	Used for installing the front bearing of the counter gear.
 ST-498077300	498077300	REMOVER	<p>Used for removing the clutch hub No. 3, hub sleeve No. 3, reverse gear, synchronizer ring No. 3, and reverse gear bearing.</p> <p>Note: Used together with REMOVER (899864100).</p>

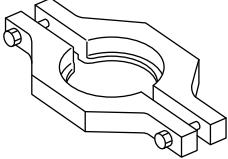
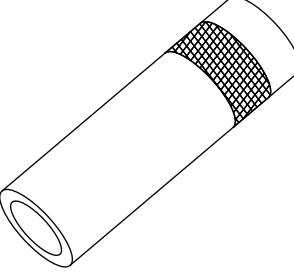
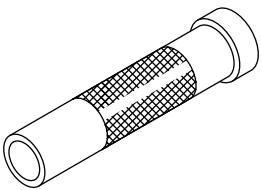
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	498077400	REMOVER	<p>Used for removing the front bearing of the counter gear.</p> <p>Note: Used together with REMOVER (899864100).</p>
	499277000	INSTALLER	<ul style="list-style-type: none"> Used for installing the clutch hub No. 1. <p>Note: Used together with BUSHING 1-2 INSTALLER (499277100) and REMOVER (899714110).</p> <ul style="list-style-type: none"> Used for installing the output shaft bearing. <p>Note: Used together with BUSHING 1-2 INSTALLER (499277100) and REMOVER (899714110).</p> <ul style="list-style-type: none"> Used for installing the 6th gear. <p>Note: Used together with BUSHING 1-2 INSTALLER (499277100) and REMOVER (899714110).</p>
	499277100	BUSHING 1-2 INSTALLER	<ul style="list-style-type: none"> Used for installing the clutch hub No. 3. <p>Note: Used together with REMOVER (899714110) and EXTENSION DRIVE SHAFT (927130000).</p> <ul style="list-style-type: none"> Used for installing the clutch hub No. 1. <p>Note: Used together with INSTALLER (499277000) and REMOVER (899714110).</p> <ul style="list-style-type: none"> Used for installing the output shaft bearing. <p>Note: Used together with INSTALLER (499277000) and REMOVER (899714110).</p>

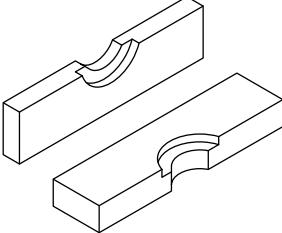
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
			<ul style="list-style-type: none"> Used for installing the 6th gear. <p>Note: Used together with INSTALLER (499277000) and REMOVER (899714110).</p>
 ST-899714110	899714110	REMOVER	<ul style="list-style-type: none"> Used for removing the drive gear. <p>Note: Used together with REMOVER (899864100).</p> <ul style="list-style-type: none"> Used for removing the clutch hub No. 2, 3rd gear, synchronizer ring set No. 3, and 3rd gear needle roller bearing. Used for removing the input shaft bearing. Used for installing the clutch hub No. 3. <p>Note: Used together with BUSHING 1-2 INSTALLER (499277100) and EXTENSION DRIVE SHAFT (927130000).</p> <ul style="list-style-type: none"> Used for installing the clutch hub No. 1. <p>Note: Used together with INSTALLER (499277000) and BUSHING 1-2 INSTALLER (499277100).</p> <ul style="list-style-type: none"> Used for installing the output shaft bearing. <p>Note: Used together with INSTALLER (499277000) and BUSHING 1-2 INSTALLER (499277100).</p> <ul style="list-style-type: none"> Used for installing the 6th gear. <p>Note: Used together with INSTALLER (499277000) and BUSHING 1-2 INSTALLER (499277100).</p>

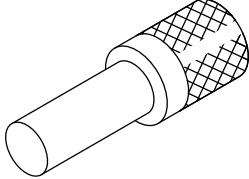
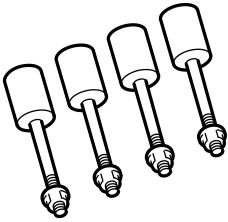
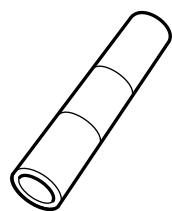
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-899864100	899864100	REMOVER	<ul style="list-style-type: none"> Used for removing the front bearing of the counter gear. <p>Note: Used together with REMOVER (498077400).</p> <ul style="list-style-type: none"> Used for removing the drive gear. <p>Note: Used together with REMOVER (899714110).</p> <ul style="list-style-type: none"> Used for removing the clutch hub No. 3, hub sleeve No. 3, reverse gear, synchronizer ring No. 3, and reverse gear bearing. <p>Note: Used together with REMOVER (498077300).</p>
 ST-927130000	927130000	EXTENSION DRIVE SHAFT	<ul style="list-style-type: none"> Used for installing the drive gear. Used for installing the input shaft bearing. Used for installing the clutch hub No. 3. <p>Note: Used together with REMOVER (899714110) and BUSHING 1-2 INSTALLER (499277100).</p>
 ST18632AA000	18632AA000	STAND ASSY	Used for disassembling and assembling the transmission body.
 ST18654AA000	18654AA000	INSTALLER	<p>Used for installing the clutch hub No. 2.</p> <p>Note: Used together with DRIFT 2 (398477703).</p>

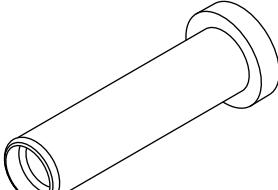
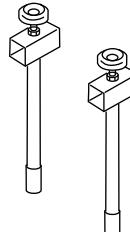
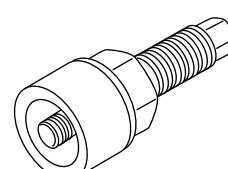
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18657AA040	18657AA040	INSTALLER	Used for installing the shift shaft oil seal.
 ST18679AA020	18679AA020	ADJUSTER	Used for removing and installing the transmission. Note: Used together with ENGINE HANGER (99099AJ000).
 ST18682AA000	18682AA000	INSTALLER	Used for installing the clutch hub No. 4, hub sleeve No. 4, gear shift fork No. 4, and gear shift fork rod No. 4.
 ST18722AA000	18722AA000	REMOVER	<ul style="list-style-type: none"> Used for removing the output shaft bearing, 1st gear, 1st bearing inner race, 1st gear needle roller bearing, and 1st shift restrict ball. Used for removing the thrust bearing, 2nd gear, clutch hub No. 1, hub sleeve No. 1, and 2nd gear needle roller bearing.

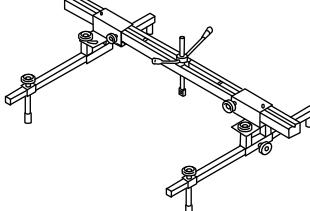
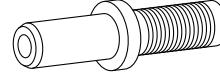
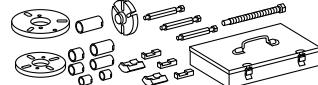
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	18752AA010 ST18752AA010	REMOVER	Used for removing the 6th gear.
	99099AJ000 ST99099AJ000	ENGINE HANGER	Used for removing and installing transmission body. Note: Used together with ADJUSTER (18679AA020).
	09325-20010 ST0932520010	TRANSMISSION OIL PLUG	Used for installing the extension case oil seal.
	09950-30012 ST0995030012	PULLER A SET	Used for removing the clutch hub No. 4, hub sleeve No. 4, gear shift fork No. 4, and gear shift fork rod No. 5. Note: UPPER PLATE (09951-03010), CENTER BOLT (09953-03010) and ADAPTER 16 (09956-03010) are used.

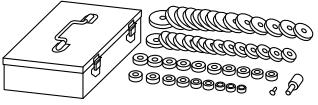
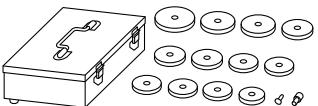
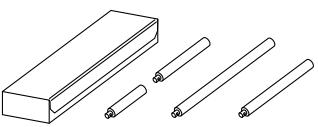
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST0995060010	09950-60010	REPLACER SET	<p>Used for installing the oil seal of the front bearing retainer.</p> <p>Note:</p> <ul style="list-style-type: none"> • REPLACER 42 (09951-00420) is used. • Used together with HANDLE 100 (09951-07100).
 ST0995060020	09950-60020	REPLACER SET No. 2	<p>Used for installing the dust cover.</p> <p>Note:</p> <ul style="list-style-type: none"> • REPLACER 75 (09951-00750) is used. • Used together with HANDLE 100 (09951-07100).
 ST0995070010	09950-70010	HANDLE SET	<ul style="list-style-type: none"> • Used for installing the oil seal of the front bearing retainer. <p>Note:</p> <ul style="list-style-type: none"> • HANDLE 100 (09951-07100) is used. • Used together with REPLACER 42 (09951-00420). <ul style="list-style-type: none"> • Used for installing the dust cover. <p>Note:</p> <ul style="list-style-type: none"> • HANDLE 100 (09951-07100) is used. • Used together with REPLACER 75 (09951-00750).
 ST1228138150	12281-38150	ENGINE HANGER NO.1	<p>Used for removing and installing transmission body.</p> <p>Note:</p> <p>Used together with BOLT (90119-14120).</p>

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	90119-14120 ST9011914120	BOLT	<p>Used for removing and installing transmission body.</p> <p>Note: Used together with ENGINE HANGER NO.1 (12281-38150).</p>
	— STSSM4	SUBARU SELECT MONITOR 4	<p>Used for setting of each function and troubleshooting for electrical system.</p> <p>Note:</p> <ul style="list-style-type: none"> • For detailed operation procedures, refer to "Help" of application. • Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).

2. OTHER

	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Thickness gauge	Used for various inspections.
Caliper	Used for measuring the dimension.
Shackle	<p>Used for removing and installing transmission body.</p> <p>Note: Load capacity: Use a shackle with a load capacity of 250 kg (551 lb) or more.</p>

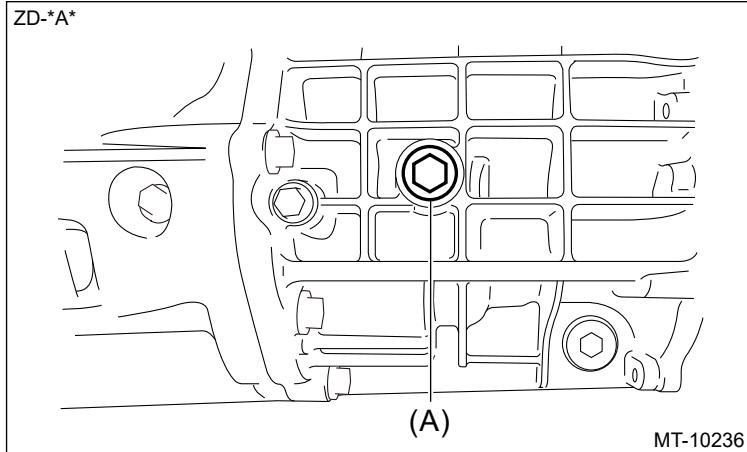
MANUAL TRANSMISSION > Transmission Gear Oil

INSPECTION

Caution:

Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.

1. Remove the under cover front and the under cover COMPL front T/M. [Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.](#)
2. Remove the filler plug (A).



3. Check the transmission gear oil.

Replace the transmission gear oil if it is degraded, clouded, or contaminated. [Ref. to MANUAL TRANSMISSION>Transmission Gear Oil>REPLACEMENT.](#)

4. Check that the transmission gear oil level is within -5 mm (-0.2 in) from the bottom of the filler plug hole.

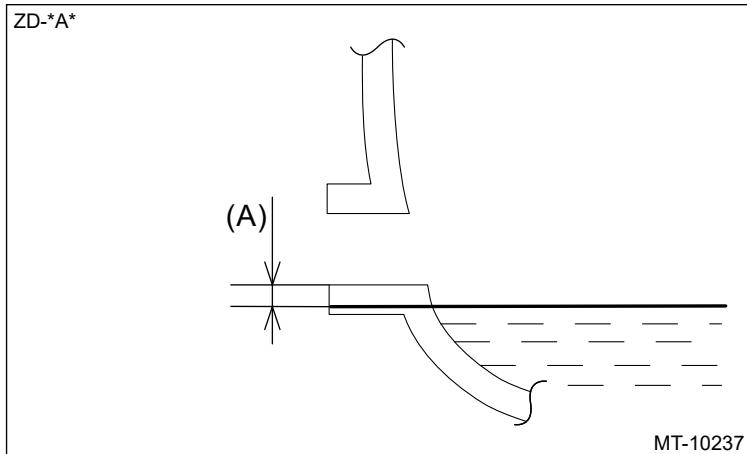
If the transmission gear oil level is low, make sure that there is no oil leakage and refill up to the bottom of filler plug hole.

Note:

Fill the transmission gear oil until it flows out of the filler plug hole and wait for the outflow to stop.

Preparation items:

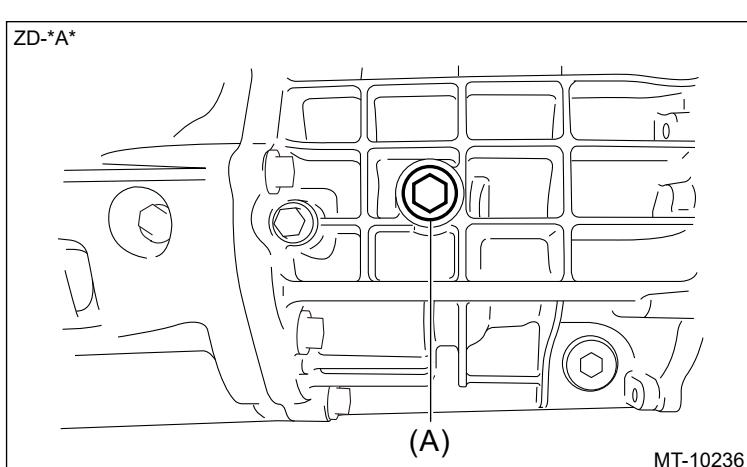
Transmission gear oil: [Ref. to MANUAL TRANSMISSION>General Description>SPECIFICATION > TRANSMISSION GEAR OIL.](#)



5. Using a new gasket, install the filler plug (A).

Tightening torque:

37 N·m (3.8 kgf-m, 27.3 ft-lb)



6. Install the under cover front and the under cover COMPL front T/M. [Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.](#)

MANUAL TRANSMISSION > Transmission Gear Oil

REPLACEMENT

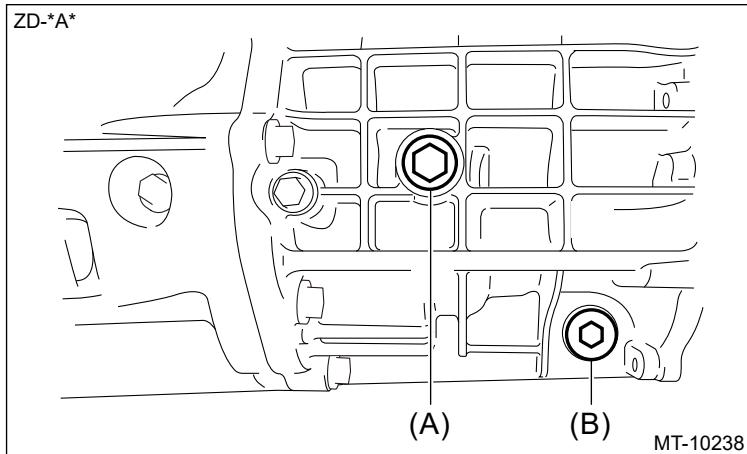
Caution:

Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.

1. Remove the under cover front and the under cover COMPL front T/M. [Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.](#)
2. Remove the filler plug (A).
3. Remove the drain plug (B) and drain the transmission gear oil.
4. Use a new gasket to install the drain plug (B).

Tightening torque:

37 N·m (3.8 kgf-m, 27.3 ft-lb)



5. Fill the transmission gear oil to the bottom of the filler plug hole.

Note:

Fill the transmission gear oil until it flows out of the filler plug hole and wait for the outflow to stop.

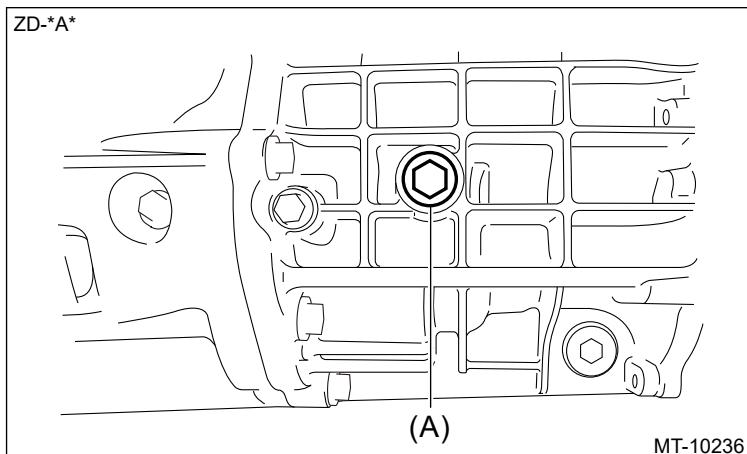
Preparation items:

Transmission gear oil: [Ref. to MANUAL TRANSMISSION>General Description>SPECIFICATION > TRANSMISSION GEAR OIL](#)

6. Using a new gasket, install the filler plug (A).

Tightening torque:

37 N·m (3.8 kgf-m, 27.3 ft-lb)



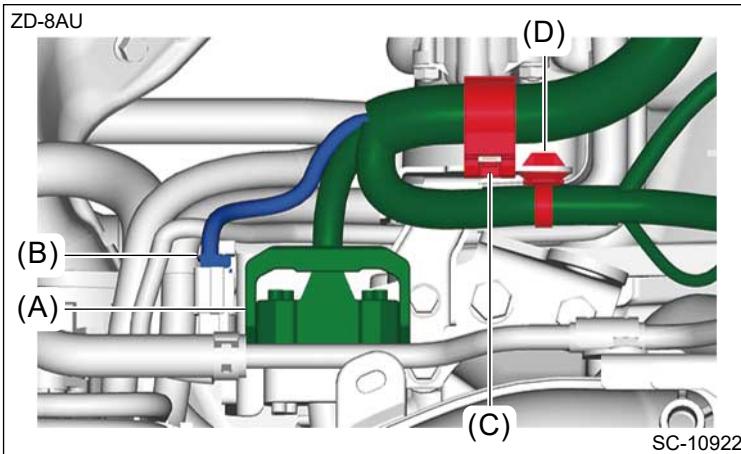
7. Install the under cover front and the under cover COMPL front T/M. [Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.](#)

MANUAL TRANSMISSION > Transmission Assembly

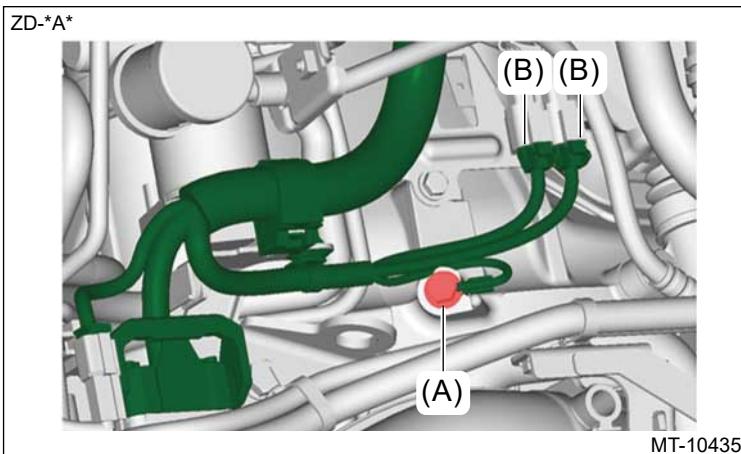
REMOVAL



1. Disconnect the ground terminal from battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
2. Remove the collector cover. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Collector Cover>REMOVAL.](#)
3. Remove the connector (A) and connector (B).
4. Remove the claw (C) and clip (D) holding the vehicle harness.



5. Disconnect the ground terminal (A).
6. Disconnect the connector (B), and place the vehicle harness aside so that it does not interfere with the work.



7. Remove the operating cylinder. [Ref. to CLUTCH SYSTEM>Operating Cylinder>REMOVAL.](#)

Note:

- Remove only the operating cylinder.
- Use a string or similar tool to hang the clutch pipe and avoid applying force to it.

8. Remove the starter. [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter>REMOVAL.](#)

- 9.** Perform the steps below to remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

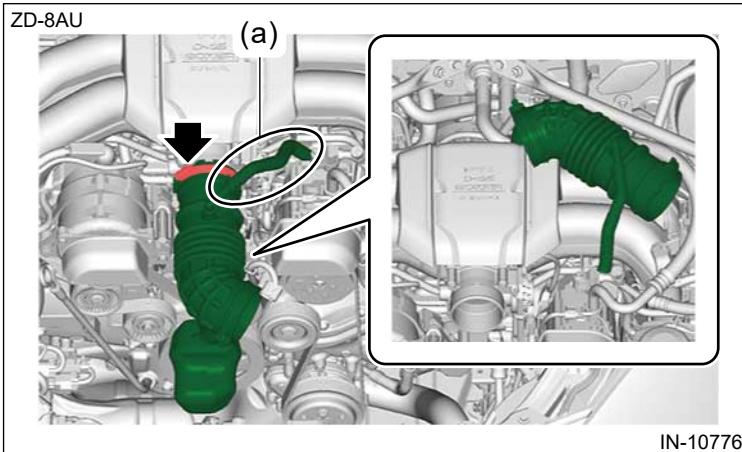
Do not remove the PCV hose No. 2 (a).

(1) Remove the air cleaner case. [Ref. to INTAKE \(INDUCTION\)\(H4DO\)>Air Cleaner Case>REMOVAL.](#)

(2) Loosen the clamp, remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

Be careful not to pull out the PCV hose No. 2 (a).

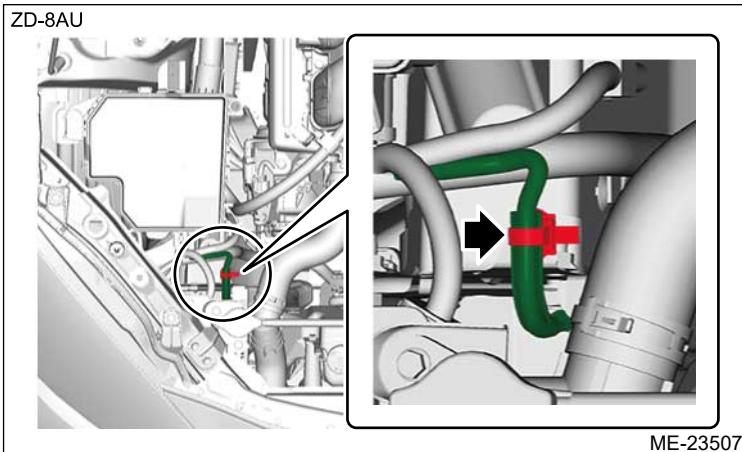


- 10.** Remove the clip securing the bulkhead wiring harness to the vehicle.

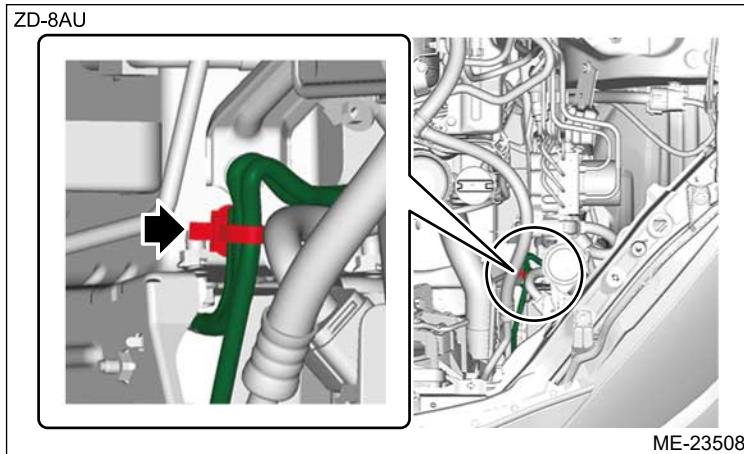
Note:

This procedure is required to prevent the bulkhead wiring harness from being damaged by the adjuster (ST).

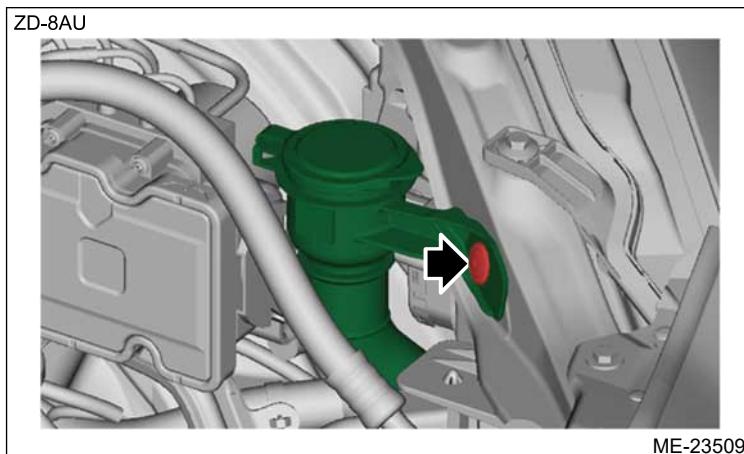
- RH side



- LH side



11. Remove the clip securing the hose inlet assembly to the vehicle.



12. Support the engine using ST1, ST2, ST3, ST4 and the shackle.

Caution:

Support the engine to prevent it from tilting when removing the manual transmission body.

(1) Using the ST1, install the ST2 to the engine unit.

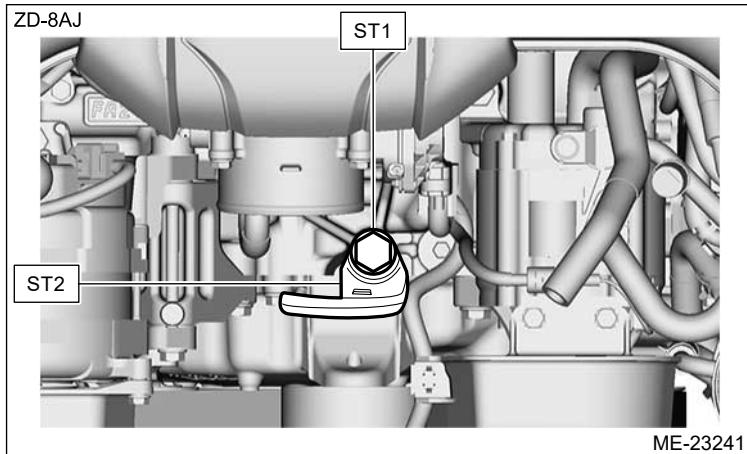
Preparation tool:

ST1: BOLT (90119-14120)

ST2: ENGINE HANGER NO.1 (12281-38150)

Tightening torque:

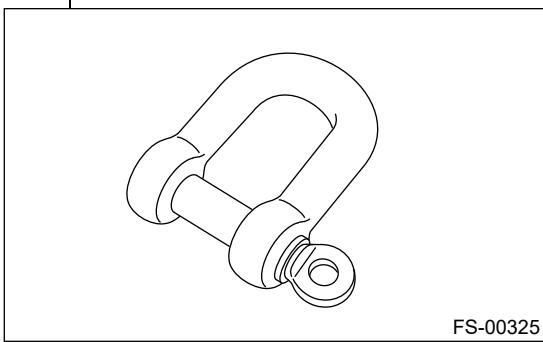
43 N·m (4.4 kgf-m, 31.7 ft-lb)



(2) Set the ST3, ST4, and the shackle to the vehicle.

Caution:

- Use a shackle with the load capacity of 250 kg (551 lb) or more.



- Set the ST3, ST4, and the shackle at the locations shown in the figure.

Preparation tool:

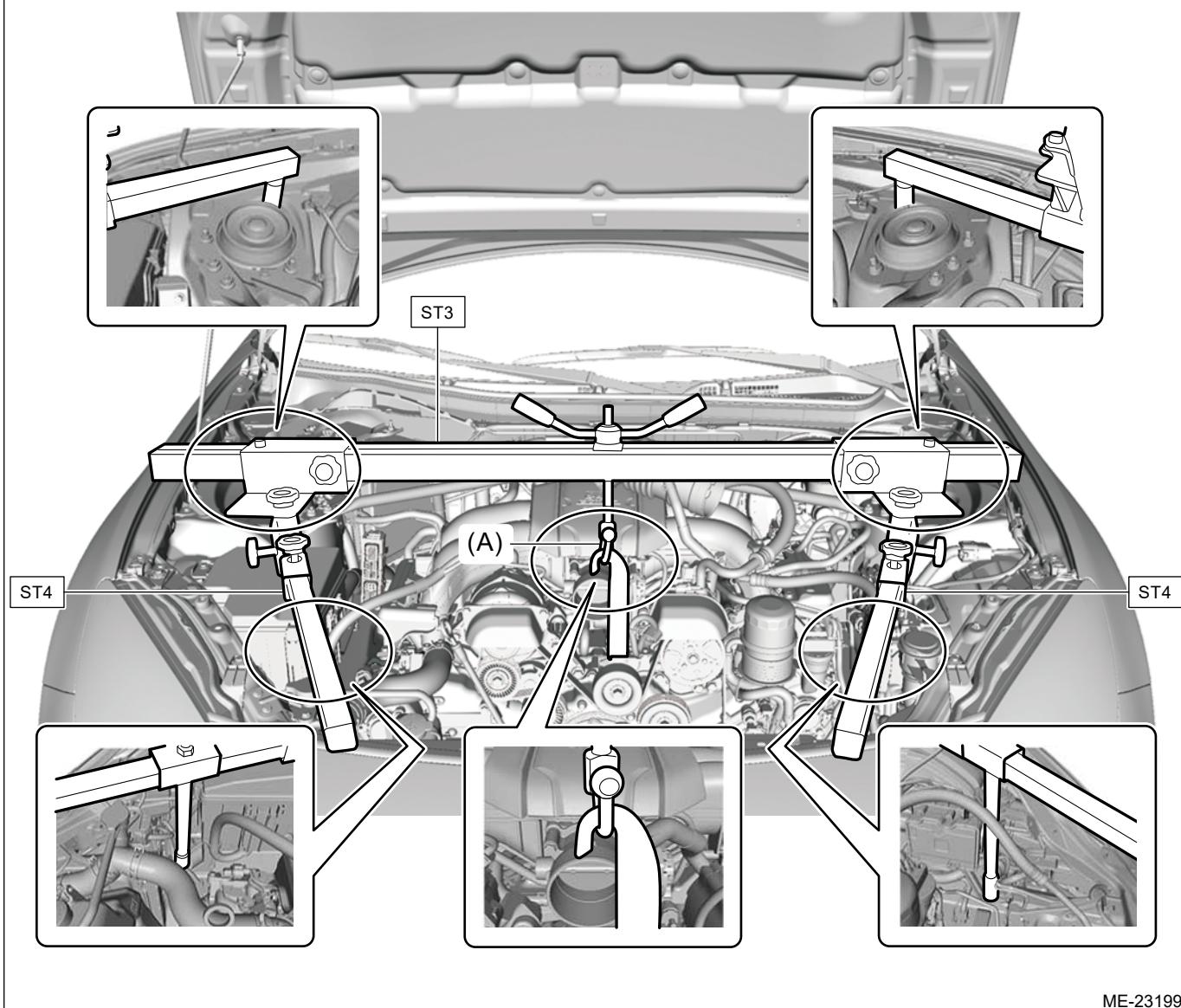
ST3: ENGINE HANGER (99099AJ000)

ST4: ADJUSTER (18679AA020)

General tool:

Shackle

ZD-8AU

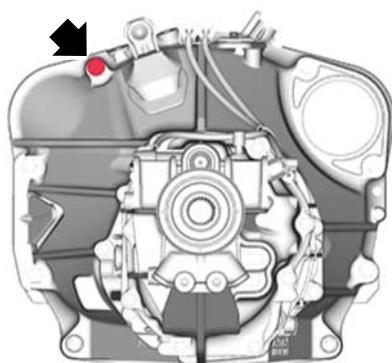


ME-23199

(A) Shackle

13. Remove the bolts which hold the upper side of the transmission.

ZD-8B*

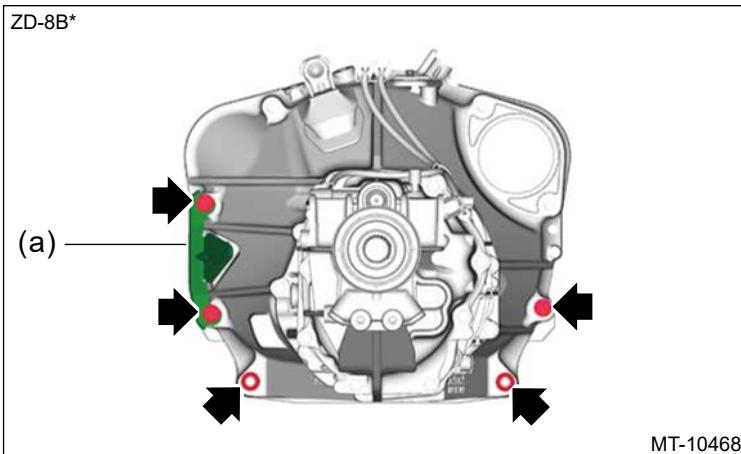


MT-10467

- 14.** Drain the transmission gear oil. [Ref. to MANUAL TRANSMISSION>Transmission Gear Oil>REPLACEMENT.](#)
- 15.** Remove the stabilizer front and the sub frame COMPL as a unit. [Ref. to FRONT SUSPENSION>Stabilizer>REMOVAL > STABILIZER.](#)
- 16.** Remove the propeller shaft. [Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Propeller Shaft>REMOVAL.](#)
- 17.** Disconnect the MT gear shift rod from the MT gear shift lever. [Ref. to CONTROL SYSTEMS>MT Gear Shift Lever>REMOVAL > MT GEAR SHIFT LEVER.](#)
- 18.** Remove the hanger bracket. [Ref. to MANUAL TRANSMISSION>Transmission Mounting System>REMOVAL > HANGER BRACKET.](#)
- 19.** Remove the bolts and nuts which hold the lower side of transmission.

Note:

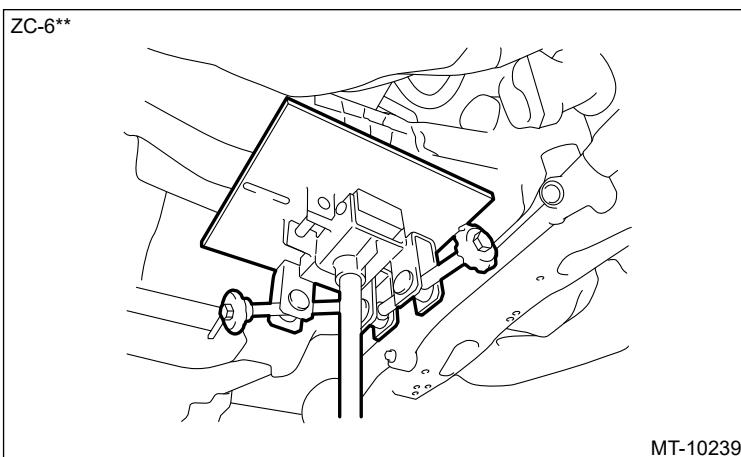
Remove the cover plate (a) together with the bolts.



- 20.** Set the transmission jack under the transmission.

Caution:

Always support the transmission case with a transmission jack.

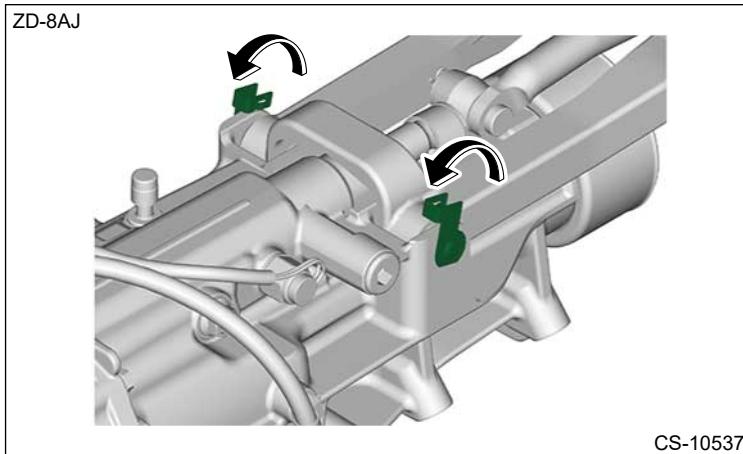


- 21.** Remove the transmission rear crossmember and rear cushion rubber. [Ref. to MANUAL TRANSMISSION>Transmission Mounting System>REMOVAL > TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER.](#)

Note:

Remove the rear cushion rubber if necessary.

- 22.** Release the lock and remove the shift retainer pins.



23. Remove the transmission body.

Caution:

Do not lower the transmission jack until the input shaft is removed from the clutch cover completely.

Note:

Adjust the position and angle of the transmission jack so that the engine and the transmission are aligned straight.

24. Remove the release lever and release bearing. [Ref. to CLUTCH SYSTEM>Release Bearing and Lever>REMOVAL.](#)

Caution:

Do not wash the release bearing since it is filled with grease.

Note:

Wash the release lever too.

25. Remove the MT gear shift rod from the transmission body. [Ref. to CONTROL SYSTEMS>MT Gear Shift Rod>REMOVAL.](#)

Note:

Remove the joint if necessary.

26. When overhauling the transmission body, refer to "Preparation for overhaul". [Ref. to MANUAL TRANSMISSION>Preparation for Overhaul>PROCEDURE > BEFORE OVERHAUL.](#)

MANUAL TRANSMISSION > Transmission Assembly

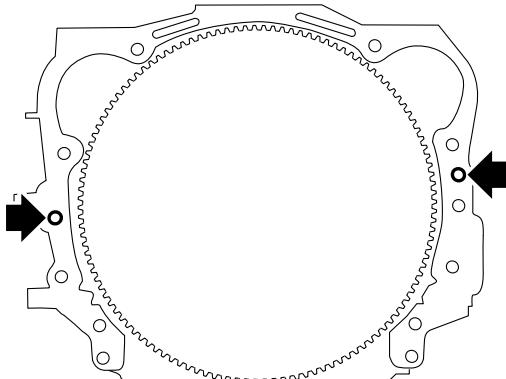
INSTALLATION

1. When having overhauled the transmission body, refer to "Preparation for overhaul". [Ref. to MANUAL TRANSMISSION>Preparation for Overhaul>PROCEDURE > AFTER OVERHAUL.](#)
2. Install the MT gear shift rod to the transmission body. [Ref. to CONTROL SYSTEMS>MT Gear Shift Rod>INSTALLATION.](#)
3. Install the release lever and release bearing to the transmission body. [Ref. to CLUTCH SYSTEM>Release Bearing and Lever>INSTALLATION.](#)
4. Install the rear cushion rubber to the transmission body. [Ref. to MANUAL TRANSMISSION>Transmission Mounting System>INSTALLATION > TRANSMISSION REAR CROSMEMBER AND REAR CUSHION RUBBER.](#)
5. Place the transmission body on the transmission jack.
6. Install the transmission body.

Note:

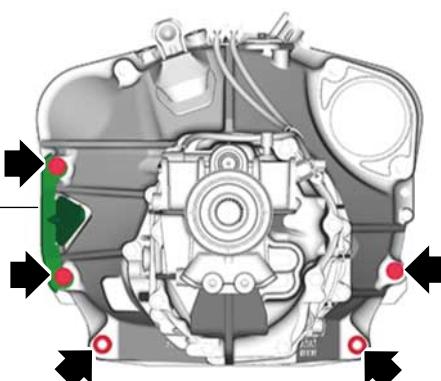
- Adjust the position and angle of the transmission jack and engine body if necessary.
- Temporarily install the bolts and nuts which hold lower side of the transmission.
- Install the cover plate (a) together with the bolts.
- Make sure that the knock pins are attached to the engine side.
If the knock pins have been removed or if they are attached to the transmission side, attach them to the engine side.

ZD-8B*



AT-10510

ZD-8B*



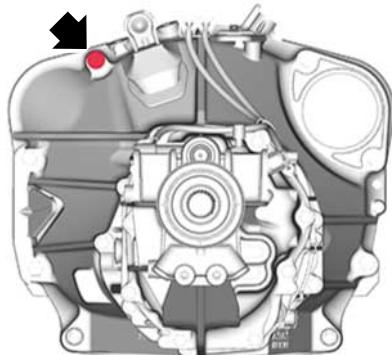
MT-10468

7. Install the shift lever retainer to the transmission body. [Ref. to CONTROL SYSTEMS>MT Gear Shift Lever>INSTALLATION > SHIFT RETAINER.](#)
8. Install the transmission rear crossmember to the transmission body. [Ref. to MANUAL TRANSMISSION>Transmission Mounting System>INSTALLATION > TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER.](#)
9. Remove the transmission jack.
10. Install the bolts which hold upper side of transmission.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

ZD-8B*



MT-10467

- 11.** Tighten the bolts and nuts which hold lower side of the transmission.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

- 12.** Install the hanger bracket. [Ref. to MANUAL TRANSMISSION>Transmission Mounting System>INSTALLATION > HANGER BRACKET.](#)

- 13.** Install the MT gear shift rod to the MT gear shift lever. [Ref. to CONTROL SYSTEMS>MT Gear Shift Lever>INSTALLATION > MT GEAR SHIFT LEVER.](#)

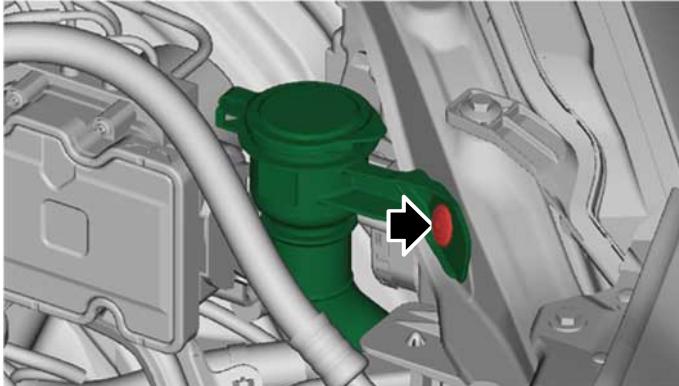
- 14.** Install the propeller shaft. [Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Propeller Shaft>INSTALLATION.](#)

- 15.** Install the stabilizer front and the sub frame COMPL as a unit. [Ref. to FRONT SUSPENSION>Stabilizer>INSTALLATION > STABILIZER.](#)

- 16.** Remove the STs (BOLT, ENGINE HANGER NO.1, ENGINE HANGER and ADJUSTER) and shackle.

- 17.** Secure the hose inlet assembly to the vehicle with the clip.

ZD-8AU

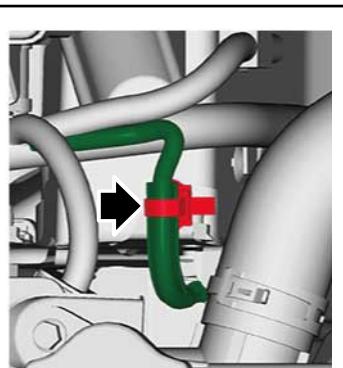
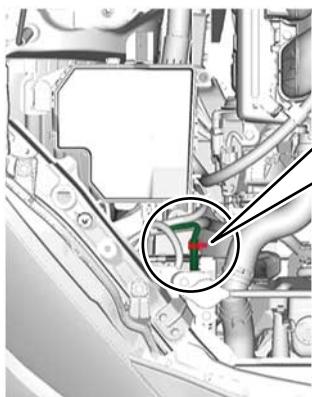


ME-23509

- 18.** Install the clip securing the bulkhead harness.

- RH side

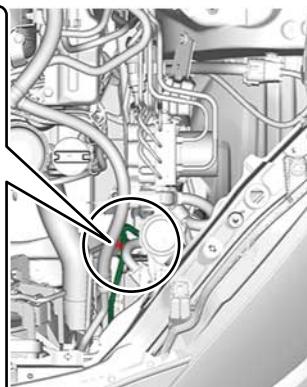
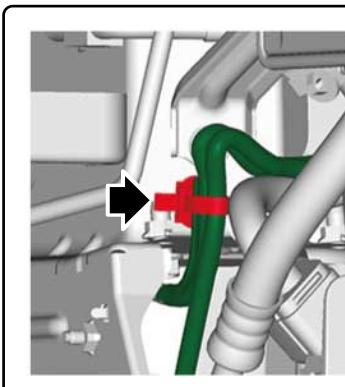
ZD-8AU



ME-23507

- LH side

ZD-8AU



ME-23508

19. Install the air intake boot. [Ref. to INTAKE \(INDUCTION\)\(H4DO\)>Air Intake Boot>INSTALLATION.](#)

20. Install the collector cover. [Ref. to FUEL INJECTION \(FUEL SYSTEMS\)\(H4DO\)>Collector Cover>INSTALLATION.](#)

21. Install the operating cylinder. [Ref. to CLUTCH SYSTEM>Operating Cylinder>INSTALLATION.](#)

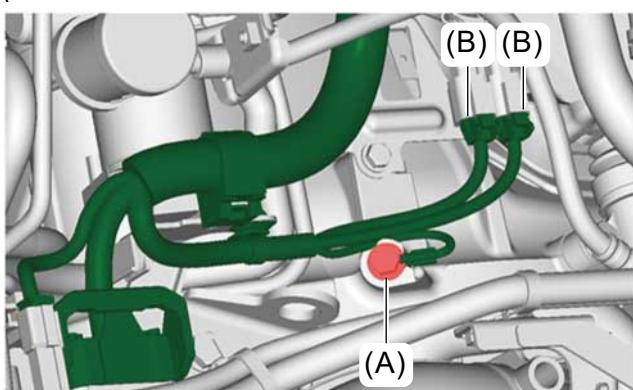
22. Connect the connector (B).

23. Connect the ground terminal (A).

Tightening torque:

13 N·m (1.3 kgf-m, 9.6 ft-lb)

ZD-*A*



MT-10435

24. Install the starter. [Ref. to STARTING/CHARGING SYSTEMS\(H4DO\)>Starter>INSTALLATION.](#)

Note:

Do not install the under cover front and the under cover COMPL front T/M.

- 25.** Connect the ground terminal to battery sensor.  [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
- 26.** Fill the transmission gear oil.  [Ref. to MANUAL TRANSMISSION>Transmission Gear Oil>REPLACEMENT.](#)
- 27.** Adjust the MT gear shift lever.  [Ref. to CONTROL SYSTEMS>MT Gear Shift Lever>ADJUSTMENT.](#)

MANUAL TRANSMISSION > Transmission Assembly

INSPECTION

- 1.** Check for oil leaks.
- 2.** Check that there is no deformation, cracks or other damages.
- 3.** Check the seat portion of the input shaft for abnormal looseness.
- 4.** Check the spline portion of the input shaft for abnormal wear.

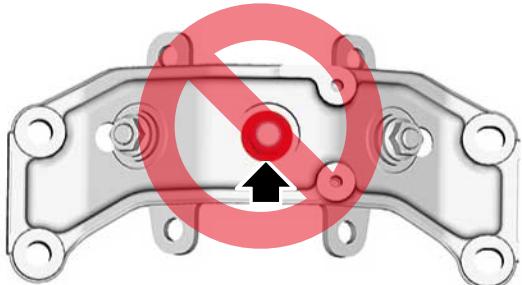
MANUAL TRANSMISSION > Transmission Mounting System

REMOVAL

**Caution:**

**Do not loosen the center nut of the rear cushion rubber.
If it is loosened, replace the rear cushion rubber with a new one.**

ZD-*A*



NG

MT-10441

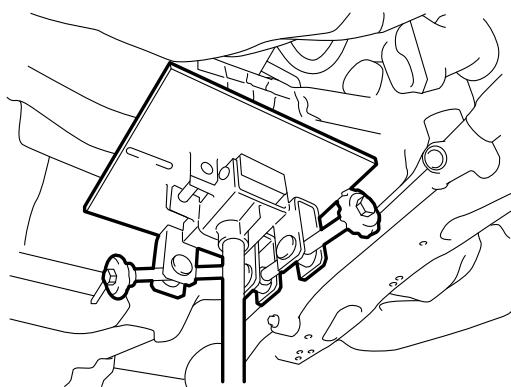
1. TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER

1. Remove the center exhaust pipe. Ref. to EXHAUST(H4DO)>Center Exhaust Pipe>**REMOVAL**.
2. Set the transmission jack.

Caution:

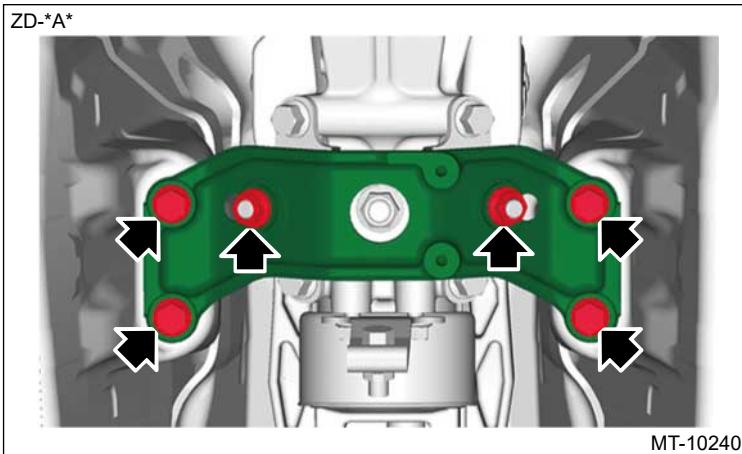
Always support the transmission case with a transmission jack.

ZC-6**

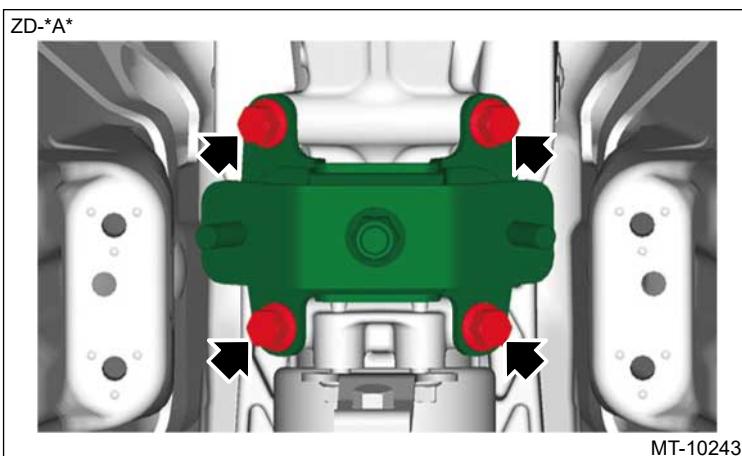


MT-10239

3. Remove the transmission rear crossmember.

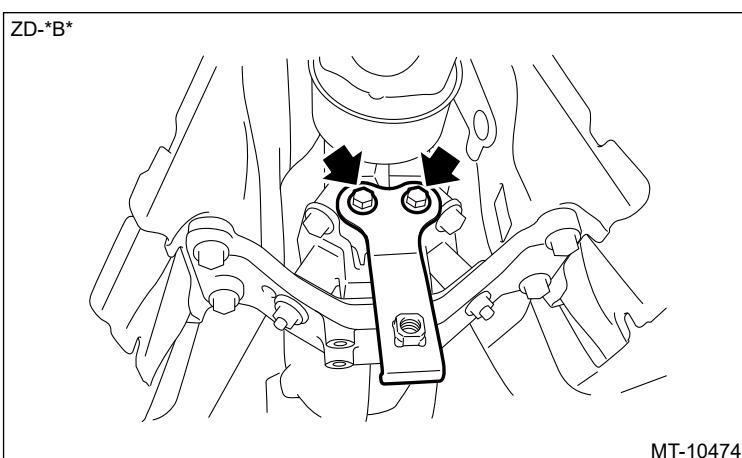


- 4.** Remove the rear cushion rubber.



2. HANGER BRACKET

- 1.** Remove the center exhaust pipe. [Ref. to EXHAUST\(H4DO\)>Center Exhaust Pipe>REMOVAL.](#)
- 2.** Remove the hanger bracket.



MANUAL TRANSMISSION > Transmission Mounting System

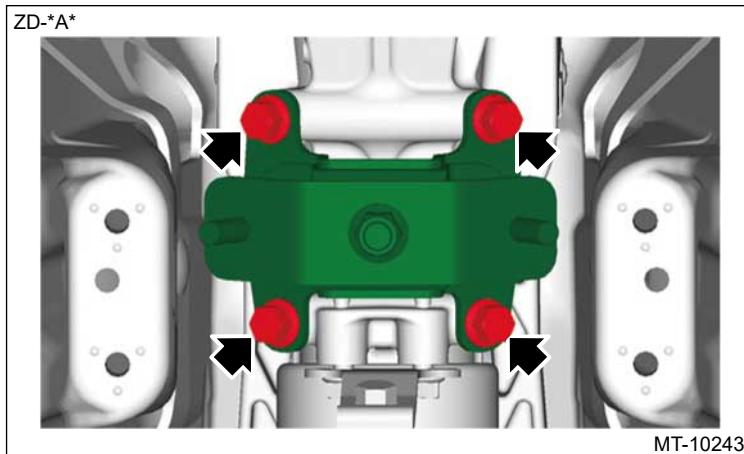
INSTALLATION

1. TRANSMISSION REAR CROSMEMBER AND REAR CUSHION RUBBER

- Install the rear cushion rubber.

Tightening torque:

40 N·m (4.1 kgf-m, 29.5 ft-lb)

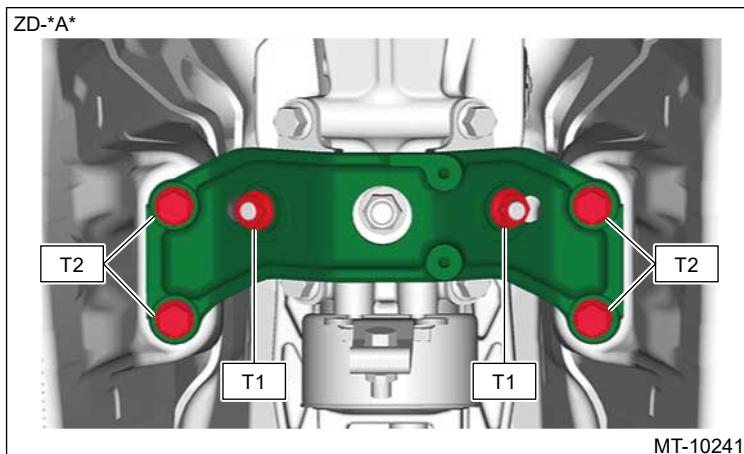


- Install the transmission rear crossmember.

Tightening torque:

T1: 55 N·m (5.6 kgf-m, 40.6 ft-lb)

T2: 65 N·m (6.6 kgf-m, 47.9 ft-lb)



- Remove the transmission jack.

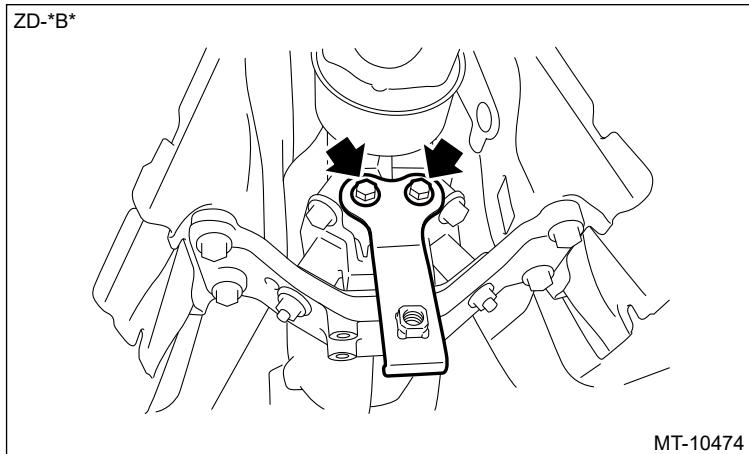
- Install the center exhaust pipe. [Ref. to EXHAUST\(H4DO\)>Center Exhaust Pipe>INSTALLATION.](#)

2. HANGER BRACKET

- Install the hanger bracket.

Tightening torque:

23 N·m (2.3 kgf-m, 17.0 ft-lb)



MT-10474

- 2.** Install the center exhaust pipe. [Ref. to EXHAUST\(H4DO\)>Center Exhaust Pipe>INSTALLATION.](#)

MANUAL TRANSMISSION > Transmission Mounting System

INSPECTION

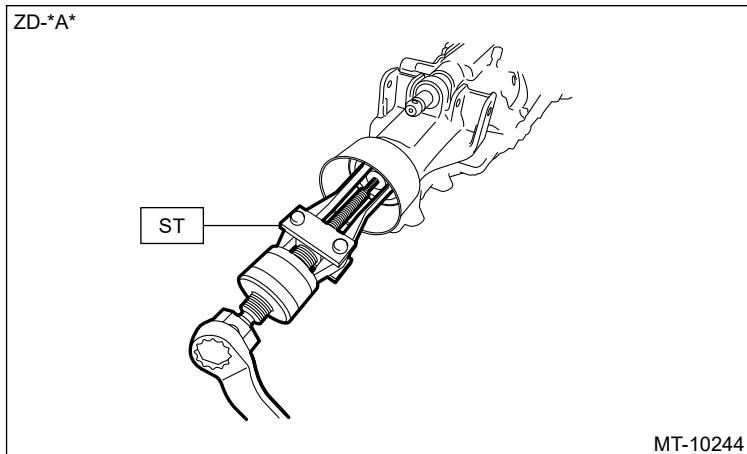
Check that there is no deformation, cracks or other damages.

MANUAL TRANSMISSION > Extension Case Oil Seal REPLACEMENT

- 1.** Release the parking brake.
- 2.** Remove the propeller shaft.  Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Propeller Shaft>[REMOVAL](#).
- 3.** Using the ST, remove the extension case oil seal.

Preparation tool:

ST: PULLER ASSY (398527700)



- 4.** Using the ST, install a new extension case oil seal.

Caution:

Be careful not to damage the extension case oil seal lip.

Note:

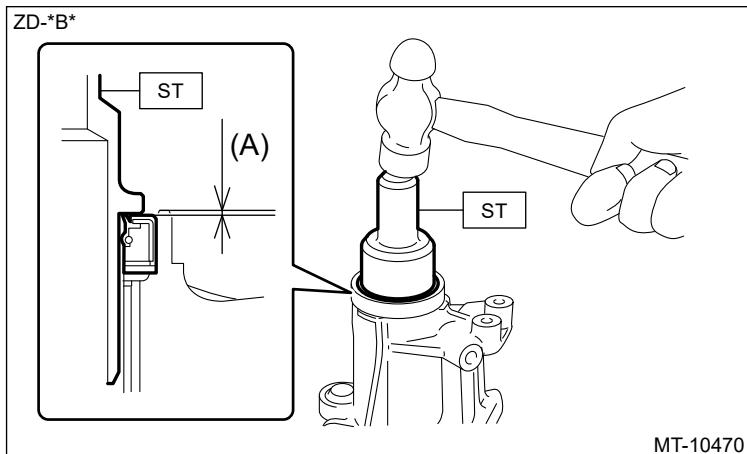
Apply transmission gear oil to the lip section and outer periphery of the extension case oil seal.

Preparation tool:

ST: TRANSMISSION OIL PLUG (09325-20010)

Insertion depth from the end surface of the extension case:

0.1 — 1.1 mm (0.004 — 0.043 in)



(A) 0.1 — 1.1 mm (0.004 — 0.043 in)

5. Install the propeller shaft.  [Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Propeller Shaft>INSTALLATION.](#)
6. Check the level of the transmission gear oil.  [Ref. to MANUAL TRANSMISSION>Transmission Gear Oil>INSPECTION.](#)
7. Apply the parking brake.

MANUAL TRANSMISSION > Extension Case Oil Seal

INSPECTION

1. Check for oil leaks.
2. Check that there is no deformation, cracks or other damages.

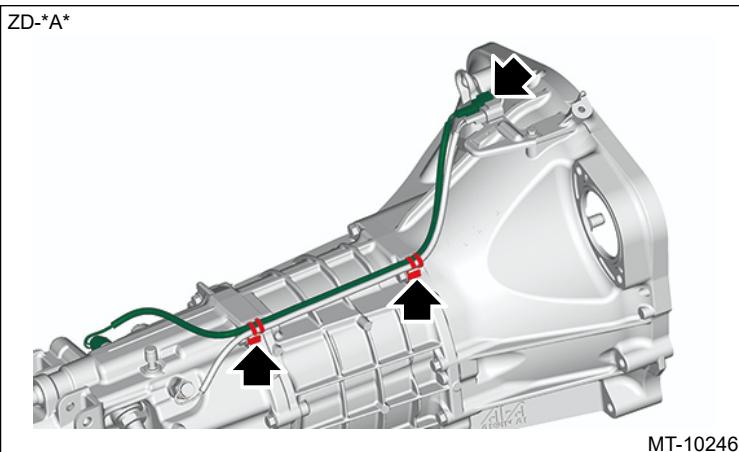
MANUAL TRANSMISSION > Switches and Harness

REMOVAL

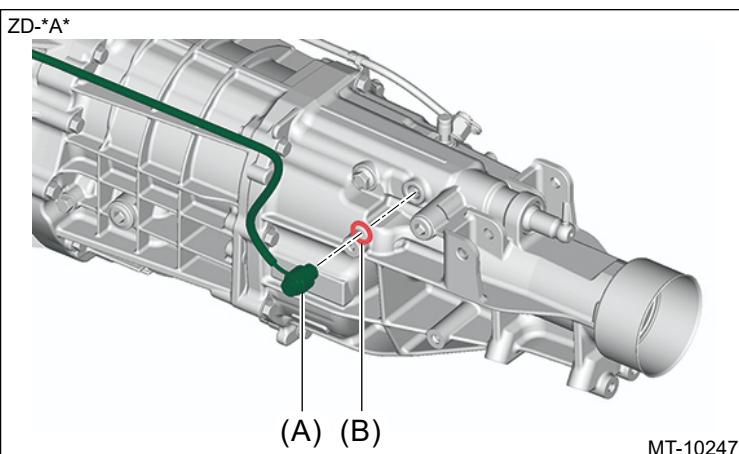


1. NEUTRAL POSITION SWITCH

1. Remove the transmission body. [Ref. to MANUAL TRANSMISSION>Transmission Assembly>REMOVAL.](#)
2. Remove the clip securing the connector and the harness.



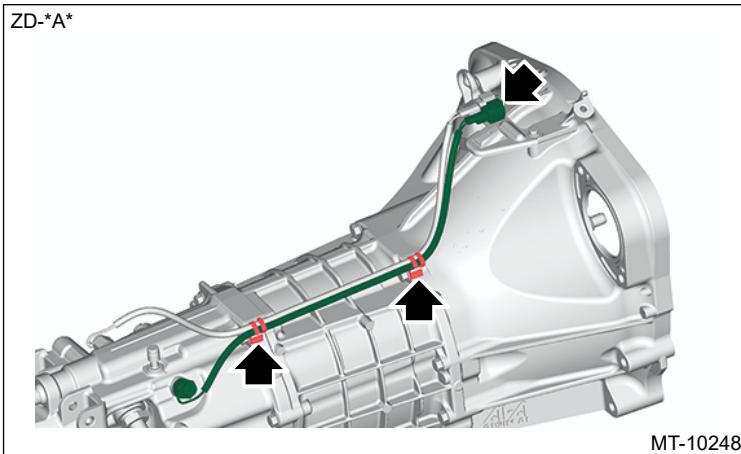
3. Remove the neutral position switch and the gasket.



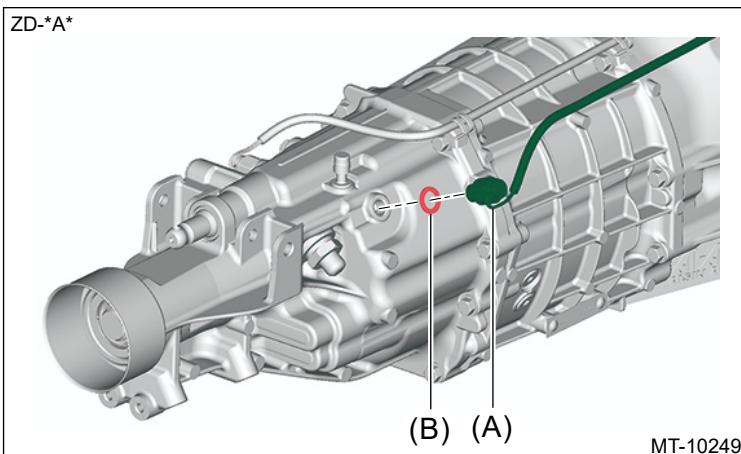
(A) Neutral position switch (B) Gasket

2. BACK-UP LIGHT SWITCH

1. Remove the transmission body. [Ref. to MANUAL TRANSMISSION>Transmission Assembly>REMOVAL.](#)
2. Remove the clip securing the connector and the harness.



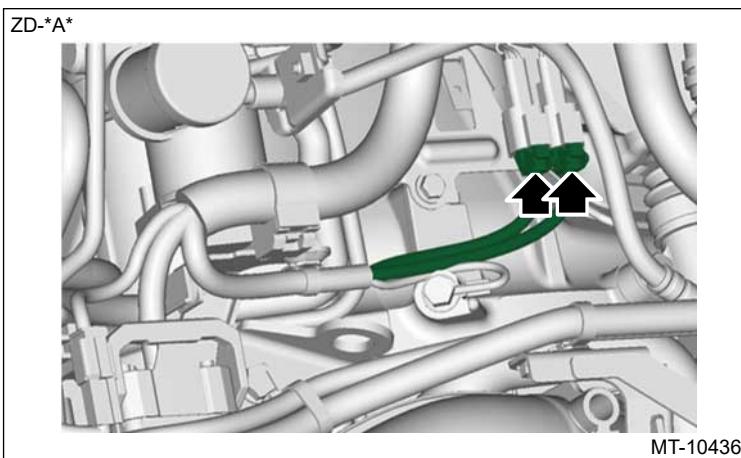
- 3.** Remove the back-up light switch and the gasket.



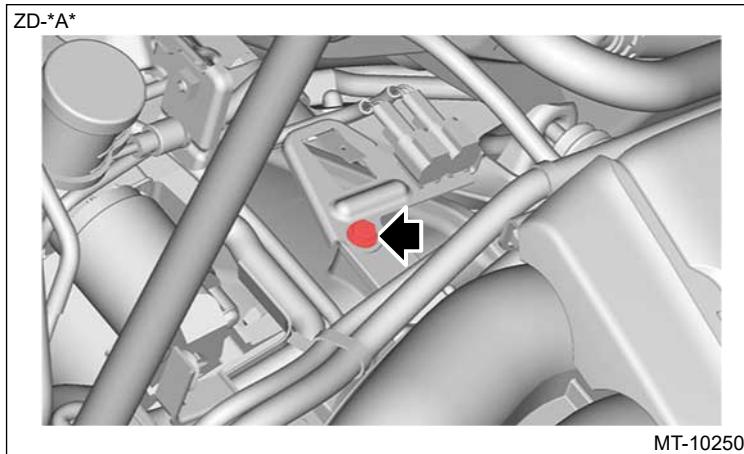
(A) Back-up light switch (B) Gasket

3. HARNESS BRACKET

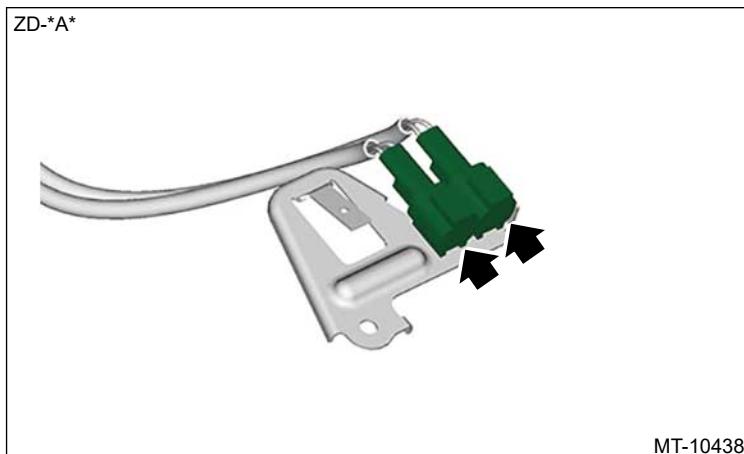
- 1.** Disconnect the ground terminal from battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
- 2.** Disconnect the connector.



- 3.** Remove the harness bracket.



4. Remove the connector.



MANUAL TRANSMISSION > Switches and Harness

INSTALLATION

1. NEUTRAL POSITION SWITCH

1. Using a new gasket, install the neutral position switch.

Note:

Use the following formula to calculate the reading of a torque wrench when tightening with a crowfoot wrench.

Calculation formula

$$T = 32.3 \text{ N}\cdot\text{m} (3.3 \text{ kgf-m}, 23.8 \text{ ft-lb}) \times L_1 / (L_1 + L_2)$$

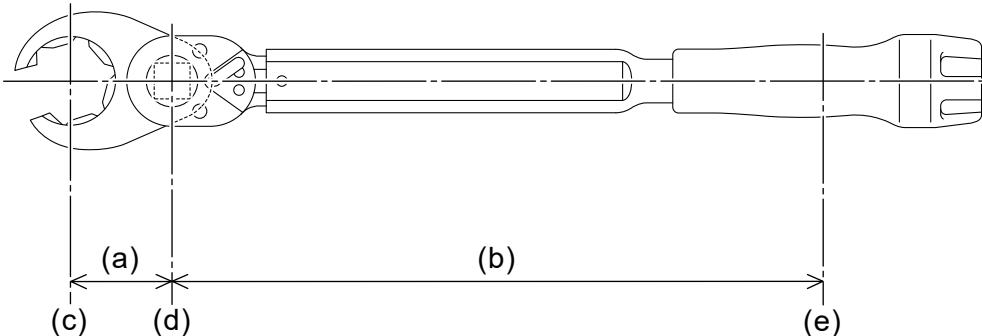
T: Reading of the torque wrench

L₁: Effective length of the torque wrench

L₂: Effective length of the crowfoot wrench

Note:

If the effective length of the tool used is unknown, consult the manufacturer of the tool.

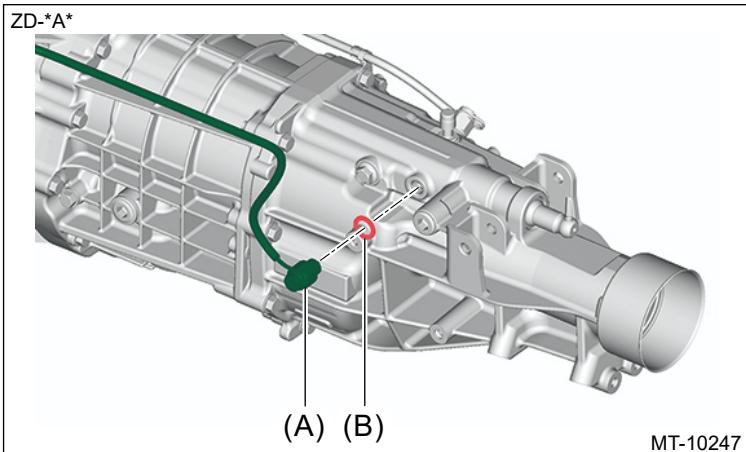


ME-20811

- (a) Effective length of the crowfoot wrench (L₂)
- (b) Effective length of the torque wrench (L₁)
- (c) Center of the open end of crowfoot wrench
- (d) Center of drive square of the torque wrench
- (e) Center of the position where a force is applied by hand

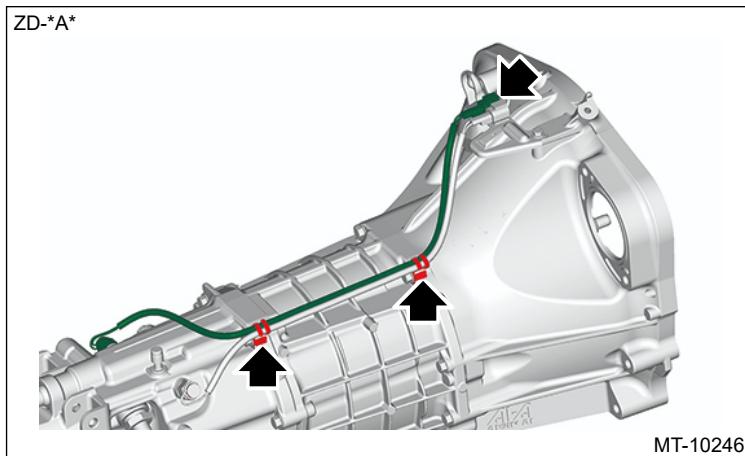
Tightening torque:

32.3 N·m (3.3 kgf-m, 23.8 ft-lb)



(A) Neutral position switch (B) Gasket

- 2.** Install the clip securing the connector and harness.



- 3.** Install the transmission body. [Ref. to MANUAL TRANSMISSION>Transmission Assembly>INSTALLATION.](#)

2. BACK-UP LIGHT SWITCH

- 1.** Using a new gasket, install the back-up light switch.

Note:

Use the following formula to calculate the reading of a torque wrench when tightening with a crowfoot wrench.

Calculation formula

$$T = 32.3 \text{ N}\cdot\text{m} (3.3 \text{ kgf-m}, 23.8 \text{ ft-lb}) \times L_1 / (L_1 + L_2)$$

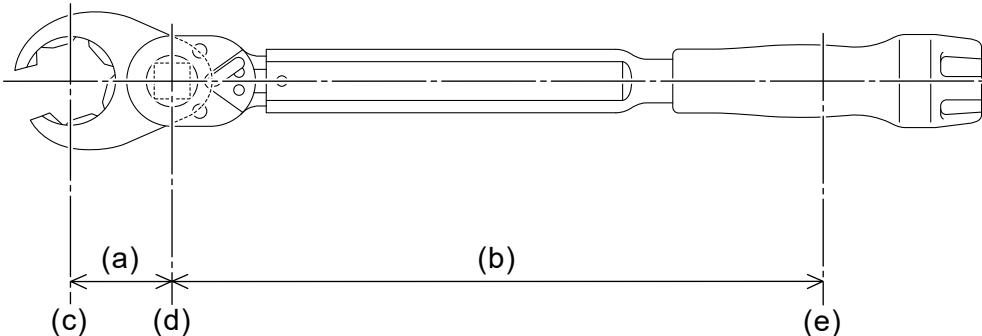
T: Reading of the torque wrench

L₁: Effective length of the torque wrench

L₂: Effective length of the crowfoot wrench

Note:

If the effective length of the tool used is unknown, consult the manufacturer of the tool.

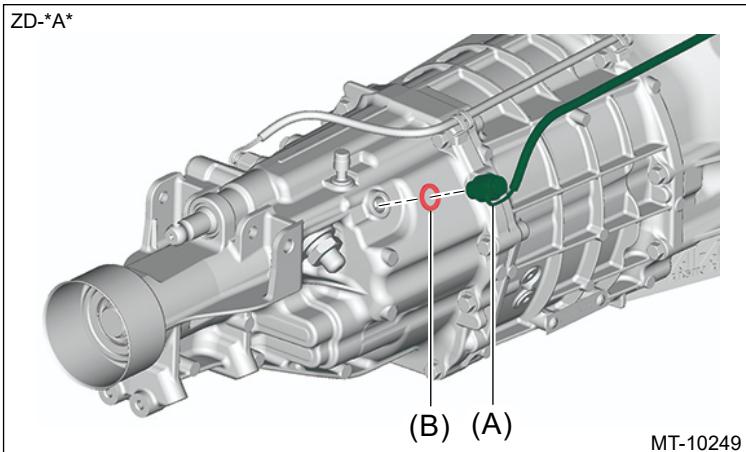


ME-20811

- (a) Effective length of the crowfoot wrench (L₂)
- (b) Effective length of the torque wrench (L₁)
- (c) Center of the open end of crowfoot wrench
- (d) Center of drive square of the torque wrench
- (e) Center of the position where a force is applied by hand

Tightening torque:

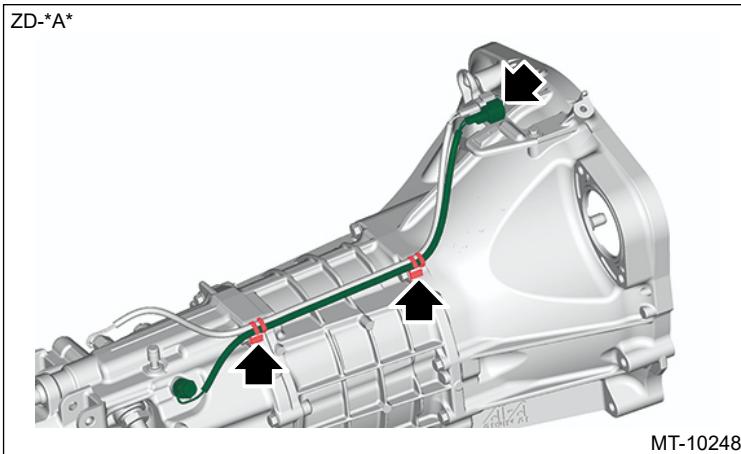
32.3 N·m (3.3 kgf-m, 23.8 ft-lb)



(A) Back-up light switch

(B) Gasket

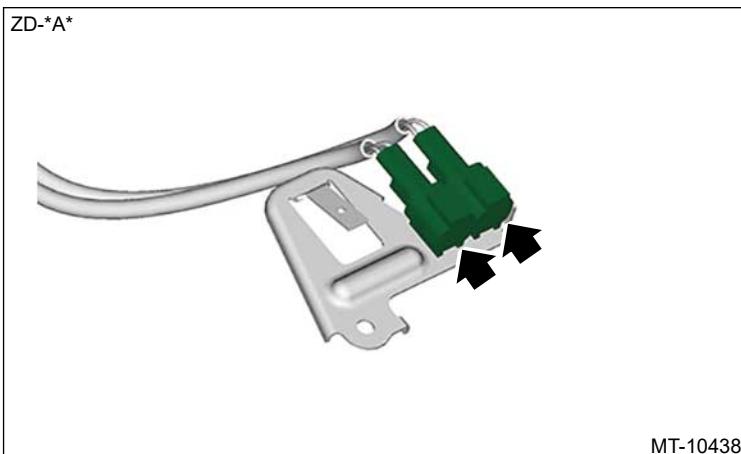
- 2.** Install the clip securing the connector and harness.



- 3.** Install the transmission body. Ref. to MANUAL TRANSMISSION>Transmission Assembly>INSTALLATION.

3. HARNESS BRACKET

- 1.** Install the connector.



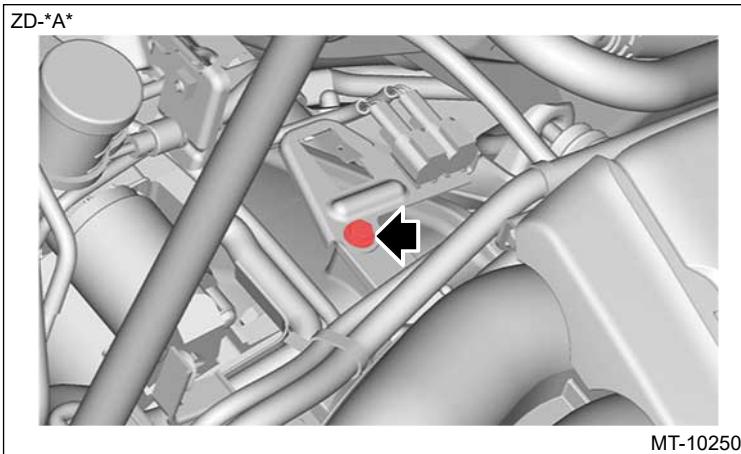
- 2.** Attach the harness bracket.

Caution:

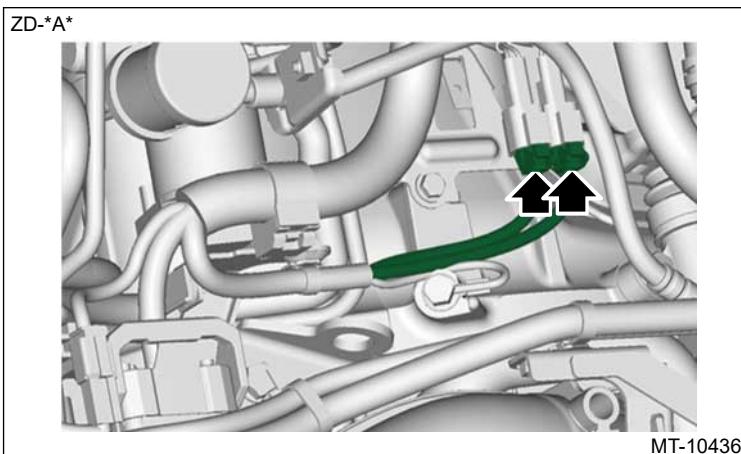
Always use a new bolt.

Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)



- 3.** Connect the connector.



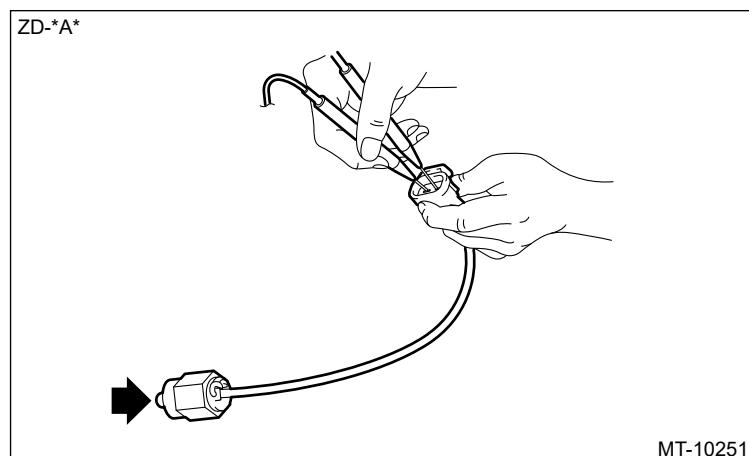
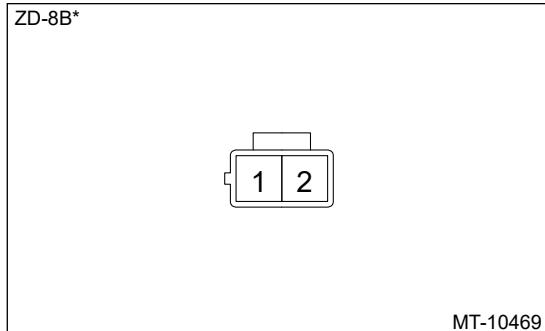
- 4.** Connect the ground terminal to battery sensor.  [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)

MANUAL TRANSMISSION > Switches and Harness

INSPECTION

1. NEUTRAL POSITION SWITCH

1. Remove the neutral position switch.  Ref. to MANUAL TRANSMISSION>Switches and Harness>REMOVAL > NEUTRAL POSITION SWITCH.
2. Check the resistance between connector terminals.

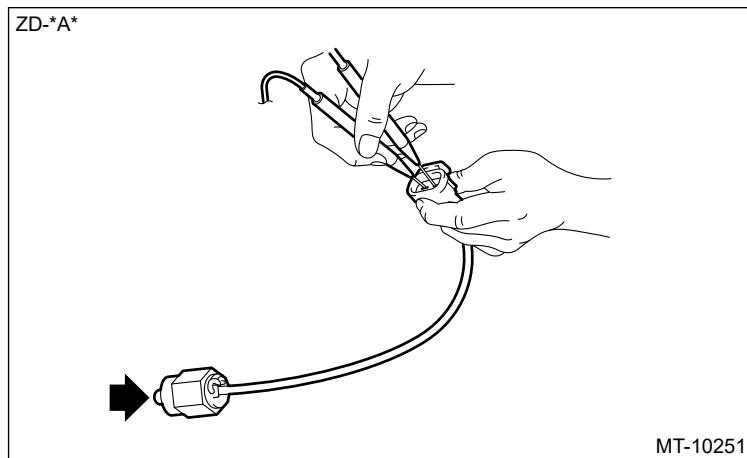
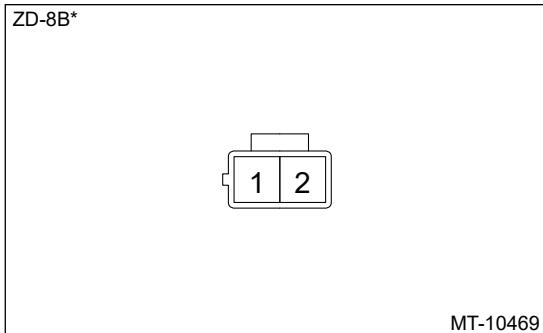


Terminal No.	Inspection conditions	Standard
1 — 2	When the switch end is pressed	1 MΩ or more
	When the switch end is not pressed	Less than 1 Ω

3. Install the neutral position switch.  Ref. to MANUAL TRANSMISSION>Switches and Harness>INSTALLATION > NEUTRAL POSITION SWITCH.

2. BACK-UP LIGHT SWITCH

1. Remove the back-up light switch.  Ref. to MANUAL TRANSMISSION>Switches and Harness>REMOVAL > BACK-UP LIGHT SWITCH.
2. Check the resistance between connector terminals.



Terminal No.	Inspection conditions	Standard
1 — 2	When the switch end is pressed	Less than 1 Ω
	When the switch end is not pressed	1 MΩ or more

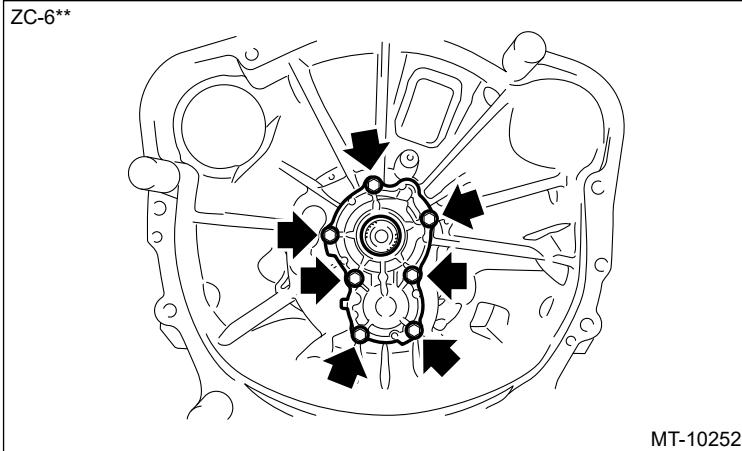
3. Install the back-up light switch. [Ref. to MANUAL TRANSMISSION>Switches and Harness>INSTALLATION > BACK-UP LIGHT SWITCH.](#)

MANUAL TRANSMISSION > Front Bearing Retainer

REMOVAL



1. Remove the transmission body. [Ref. to MANUAL TRANSMISSION>Transmission Assembly>REMOVAL.](#)
2. Remove the front bearing retainer.



3. Remove the liquid gasket from the clutch housing and front bearing retainer.

MANUAL TRANSMISSION > Front Bearing Retainer

INSTALLATION

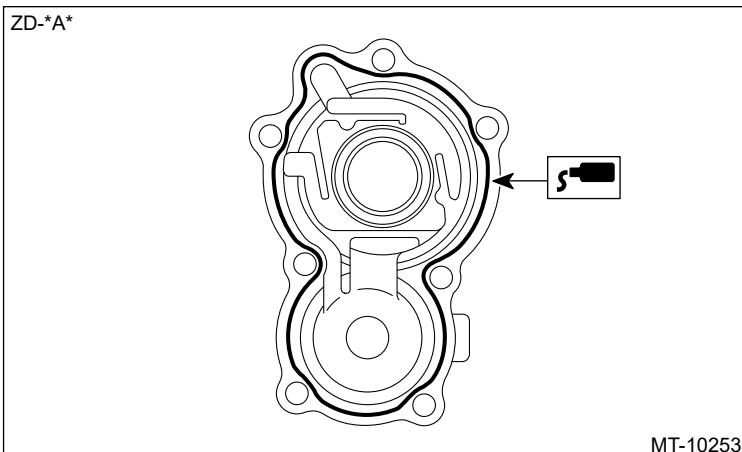
1. Apply liquid gasket to the mating surface of the front bearing retainer as shown in the figure.

Note:

- Before applying liquid gasket, degrease the liquid gasket seal surfaces of the clutch housing and front bearing retainer.
- Install within 10 min. after applying liquid gasket.

Preparation items:

Liquid gasket: THREE BOND 1281 or equivalent

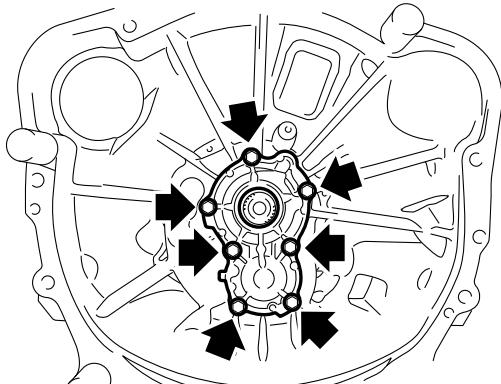


2. Install the front bearing retainer.

Caution:**Always use a new bolt.****Tightening torque:**

17 N·m (1.7 kgf-m, 12.5 ft-lb)

ZC-6**



MT-10252

3. Install the transmission body. Ref. to MANUAL TRANSMISSION>Transmission Assembly>INSTALLATION.

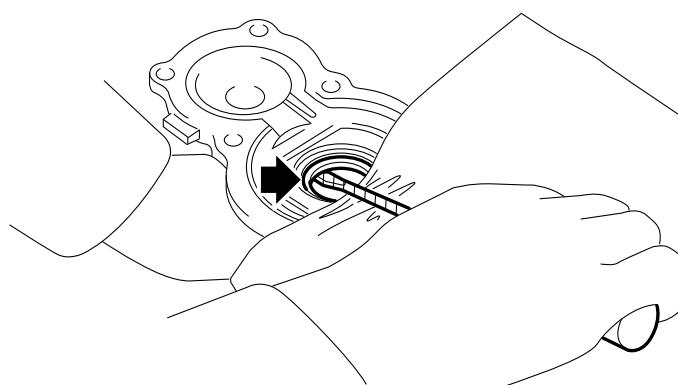
MANUAL TRANSMISSION > Front Bearing Retainer**DISASSEMBLY**
**GENERAL
SST**

1. Remove the oil seal using a flat tip screwdriver wrapped with protection tape.

Caution:

When removing the oil seal, place a cloth onto the front bearing retainer to avoid damaging it.

ZD-*A*



MT-10255

MANUAL TRANSMISSION > Front Bearing Retainer**ASSEMBLY**

1. Install a new oil seal using the ST1 and ST2.

Caution:

Be careful not to damage the oil seal lip.

Note:

Apply transmission gear oil to the oil seal lips.

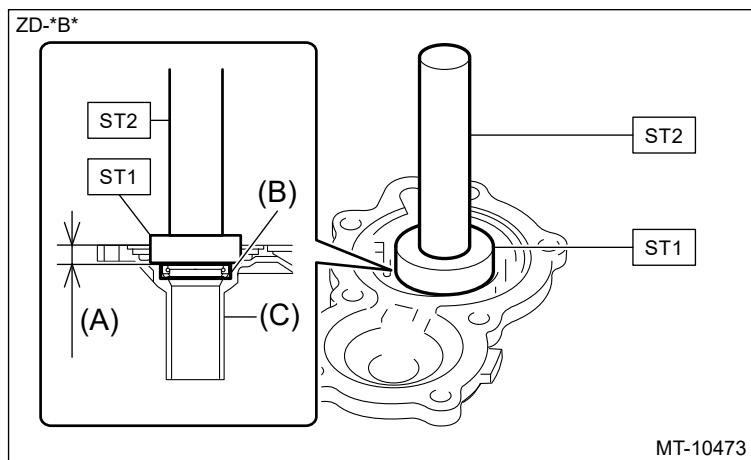
Preparation tool:

ST1: REPLACER 42 (09951-00420)

ST2: HANDLE 100 (09951-07100)

Insertion depth from the mating surface of the front bearing retainer:

11.1 — 11.9 mm (0.44 — 0.47 in)



(A) 11.1 — 11.9 mm (0.44 —
0.47 in)

(B) Oil seal

(C) Front bearing retainer

MANUAL TRANSMISSION > Front Bearing Retainer

INSPECTION

Check that there is no deformation, cracks or other damages.

MANUAL TRANSMISSION > Preparation for Overhaul

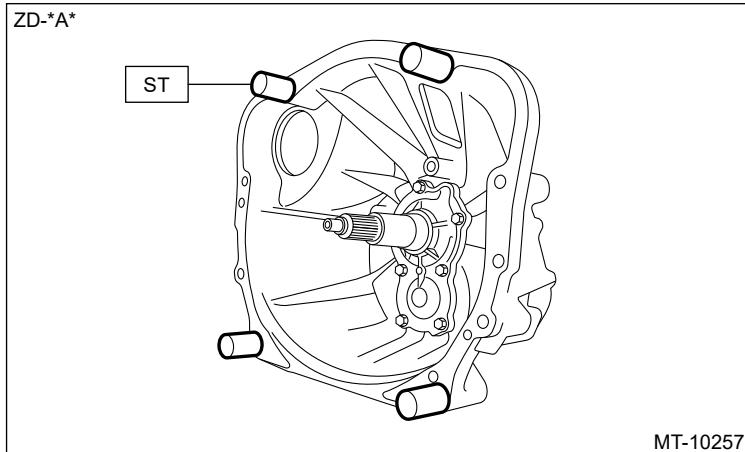
PROCEDURE

1. BEFORE OVERHAUL

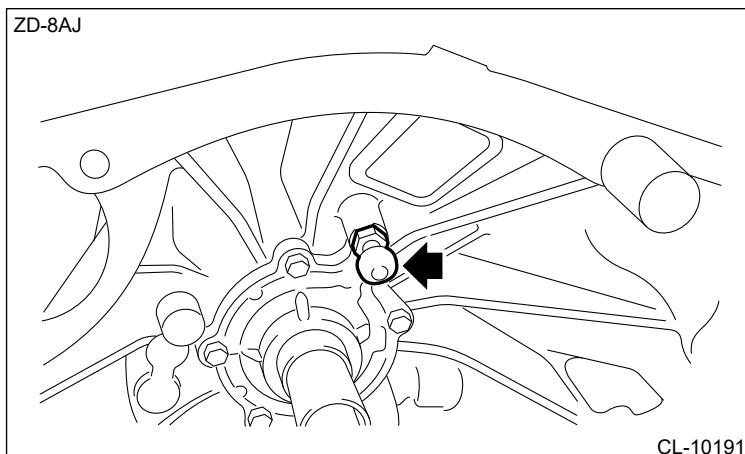
1. Attach the ST.

Preparation tool:

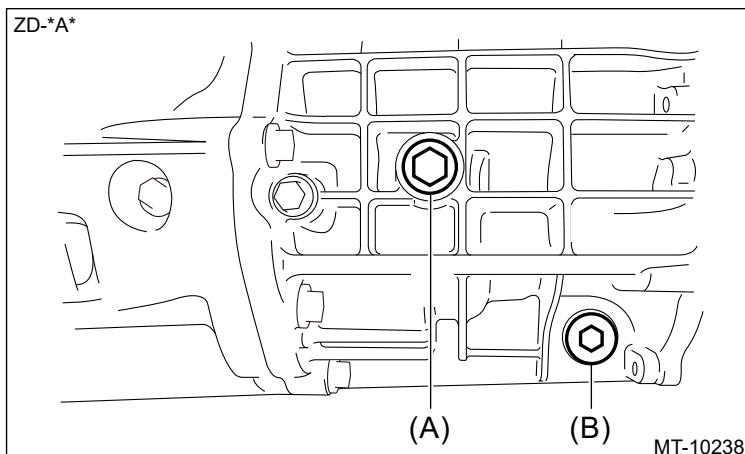
ST: STAND ASSY (18632AA000)



2. Remove the pivot.



3. Remove the filler plug (A) and drain plug (B).



4. Place the transmission body.

Note:

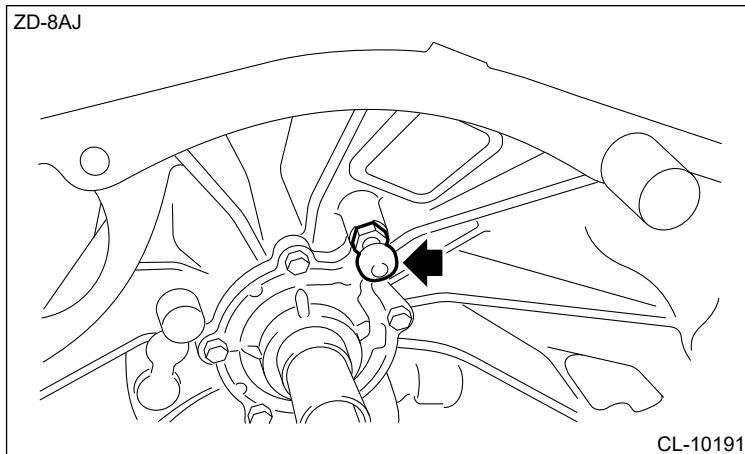
Prepare a container for draining of oil, because any transmission gear oil remaining inside the transmission body may flow out from the input shaft portion.

2. AFTER OVERHAUL

1. Remove the ST (STAND ASSY).
2. Install the pivot.

Tightening torque:

16 N·m (1.6 kgf-m, 11.8 ft-lb)



3. Use a new gasket to install the drain plug (B).

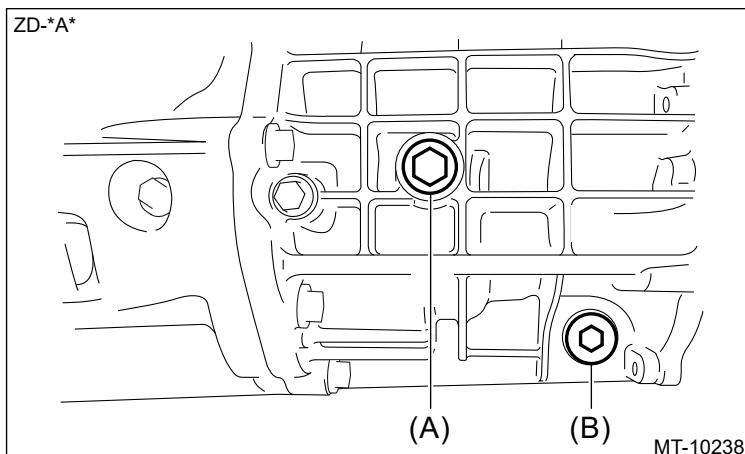
Tightening torque:

37 N·m (3.8 kgf-m, 27.3 ft-lb)

4. Temporarily install the filler plug (A).

Note:

Replace the filler plug gasket with a new part after adjusting the level of transmission gear oil.

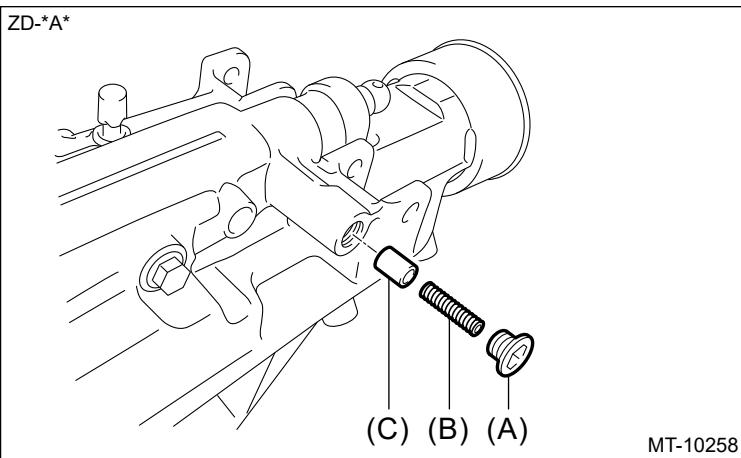


MANUAL TRANSMISSION > Extension Case

REMOVAL



1. Remove the transmission body. [Ref. to MANUAL TRANSMISSION>Transmission Assembly>REMOVAL.](#)
2. Remove the neutral position switch. [Ref. to MANUAL TRANSMISSION>Switches and Harness>REMOVAL > NEUTRAL POSITION SWITCH.](#)
3. Remove the back-up light switch. [Ref. to MANUAL TRANSMISSION>Switches and Harness>REMOVAL > BACK-UP LIGHT SWITCH.](#)
4. Remove the head straight screw plug, compression spring, and lock ball pin.

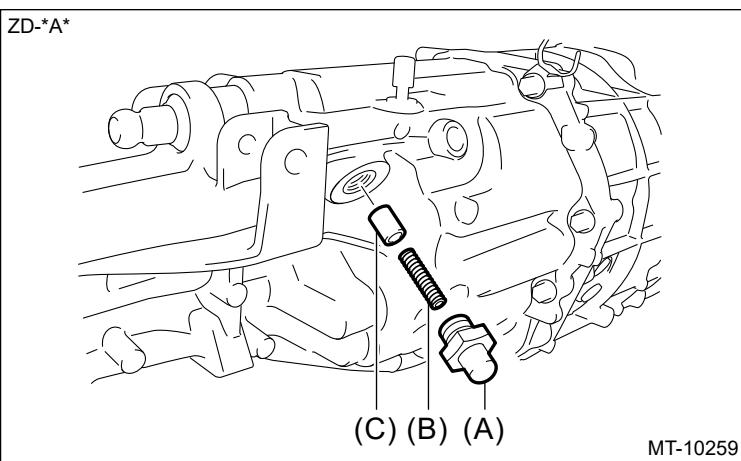


(A) Head straight screw plug

(B) Compression spring

(C) Lock ball pin

5. Remove the holder, compression spring, and lock ball pin.

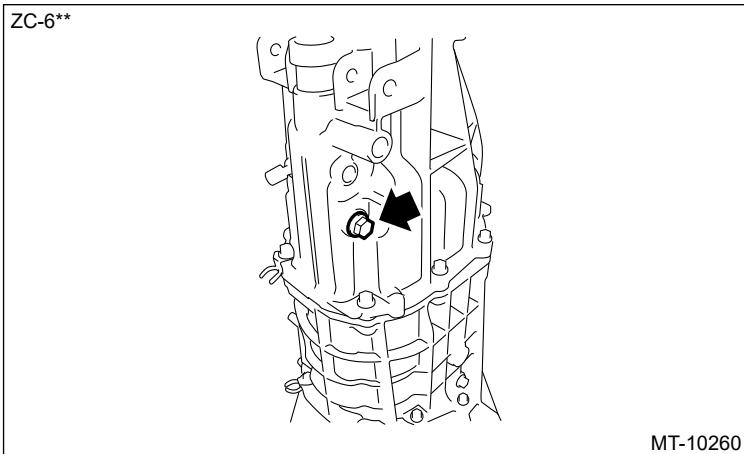


(A) Holder

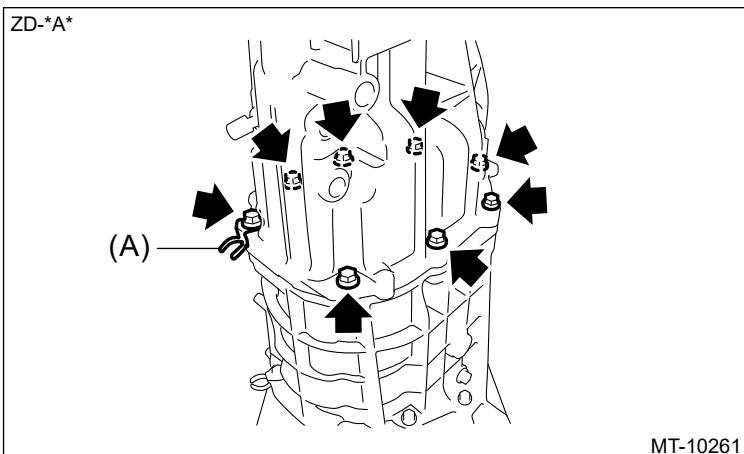
(B) Compression spring

(C) Lock ball pin

6. Remove the bolt securing the shift block.



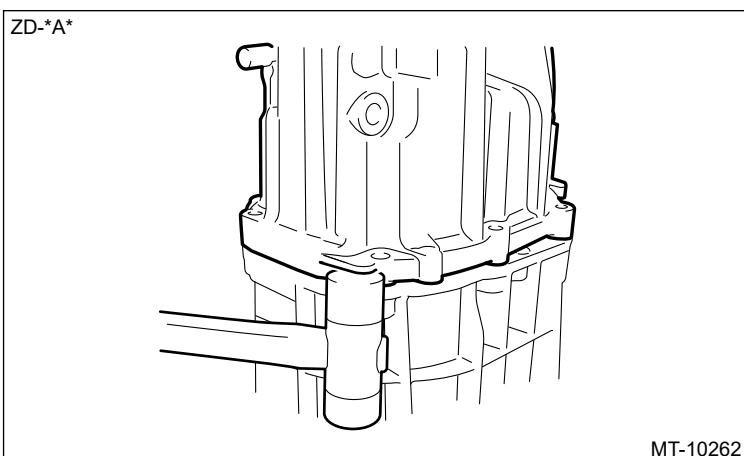
- 7.** Remove the bolts securing the extension case and clamp (A).



- 8.** Using a plastic hammer, expand the clearance and remove the extension case.

Caution:

- Be sure to remove the extension case with the shift position in neutral status.
- Be careful not to damage the extension case.



- 9.** Remove the liquid gasket from the extension case and the transmission case.

MANUAL TRANSMISSION > Extension Case

INSTALLATION

1. Install the extension case.

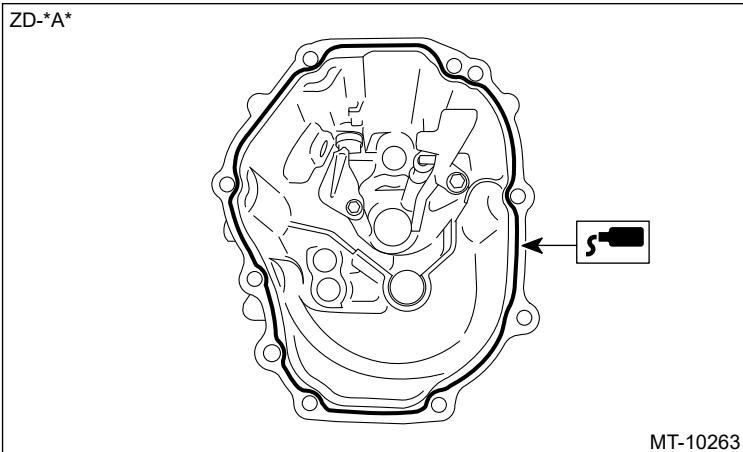
(1) Apply liquid gasket to the mating surface of the extension case as shown in the figure.

Note:

- Before applying liquid gasket, degrease the old liquid gasket seal surfaces of the extension case and transmission case.
- Install within 10 min. after applying liquid gasket.

Preparation items:

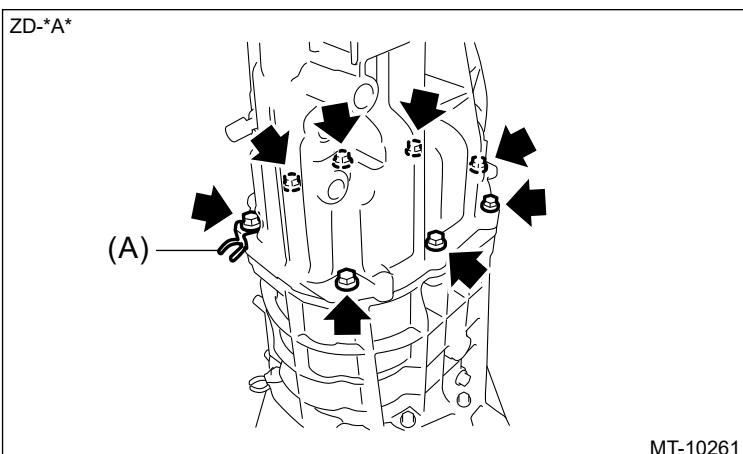
Liquid gasket: THREE BOND 1281 or equivalent



(2) Temporarily install the extension case and the clamp (A).

Caution:

- Be careful not to damage the oil seal of the extension case.
- Be sure to install the extension case with the shift position in neutral status.
- Always use a new bolt.
- Align the knock pin into the knock pin hole correctly.



(3) Tighten the bolts securing the extension case and clamp.

Tightening torque:

29 N·m (3.0 kgf-m, 21.4 ft-lb)

2. Install the bolt securing the shift block.

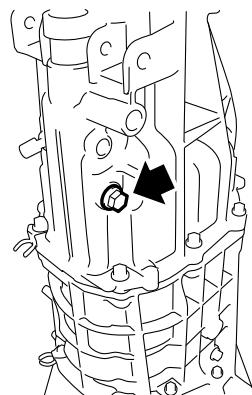
Caution:

Always use a new bolt.

Tightening torque:

31 N·m (3.2 kgf-m, 22.9 ft-lb)

ZC-6**



MT-10260

3. Install the holder, compression spring, and lock ball pin.

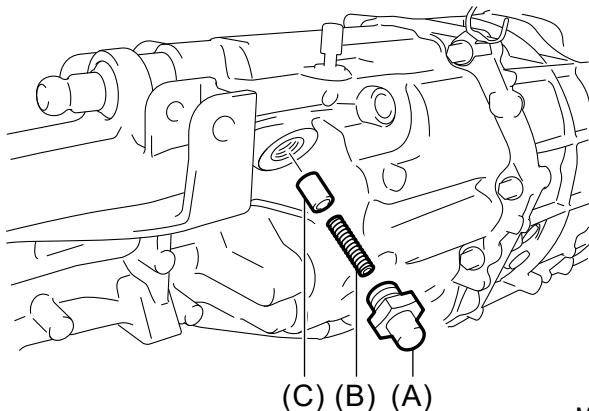
Caution:

Always use a new holder.

Tightening torque:

39.2 N·m (4.0 kgf-m, 28.9 ft-lb)

ZD-*A*



MT-10259

(A) Holder

(B) Compression spring

(C) Lock ball pin

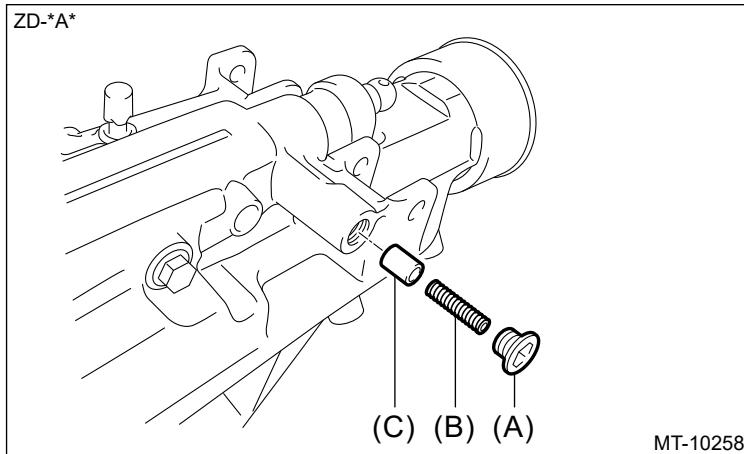
4. Install the head straight screw plug, compression spring, and lock ball pin.

Caution:

Always use a new head straight screw plug.

Tightening torque:

24.5 N·m (2.5 kgf-m, 18.1 ft-lb)



(A) Head straight screw plug (B) Compression spring (C) Lock ball pin

5. Install the back-up light switch. [Ref. to MANUAL TRANSMISSION>Switches and Harness>INSTALLATION > BACK-UP LIGHT SWITCH.](#)
6. Install the neutral position switch. [Ref. to MANUAL TRANSMISSION>Switches and Harness>INSTALLATION > NEUTRAL POSITION SWITCH.](#)
7. Install the transmission body. [Ref. to MANUAL TRANSMISSION>Transmission Assembly>INSTALLATION.](#)

MANUAL TRANSMISSION > Extension Case

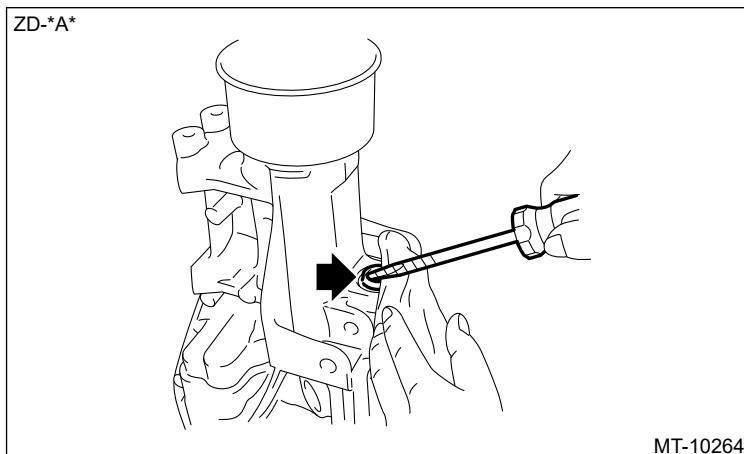
DISASSEMBLY



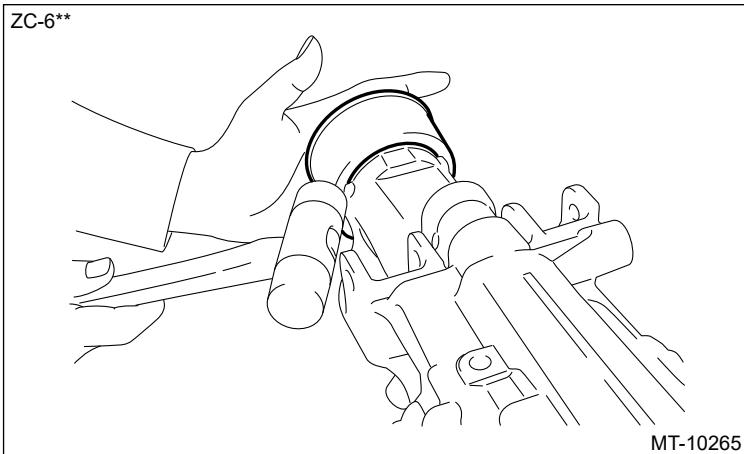
1. Remove the oil seal using a flat tip screwdriver wrapped with protection tape.

Caution:

When removing the oil seal, place a cloth onto the extension case to avoid damaging it.



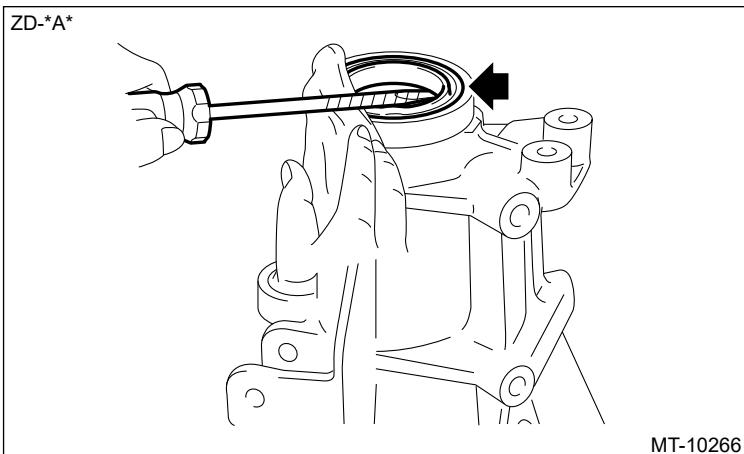
2. Remove the dust cover.



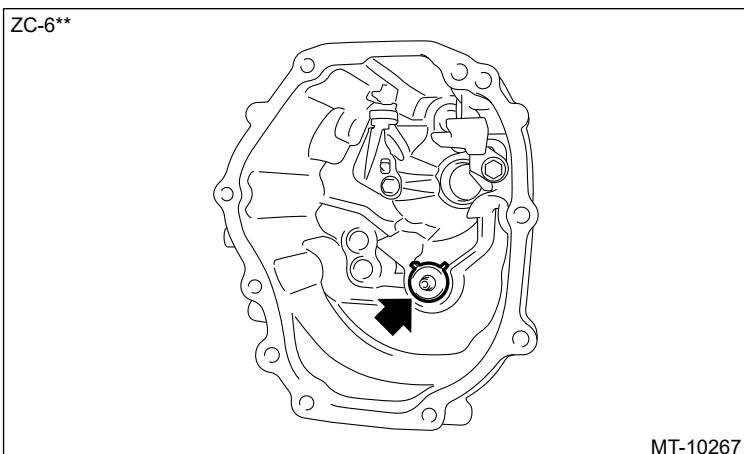
3. Remove the extension case oil seal using a flat tip screwdriver wrapped with protection tape, etc.

Caution:

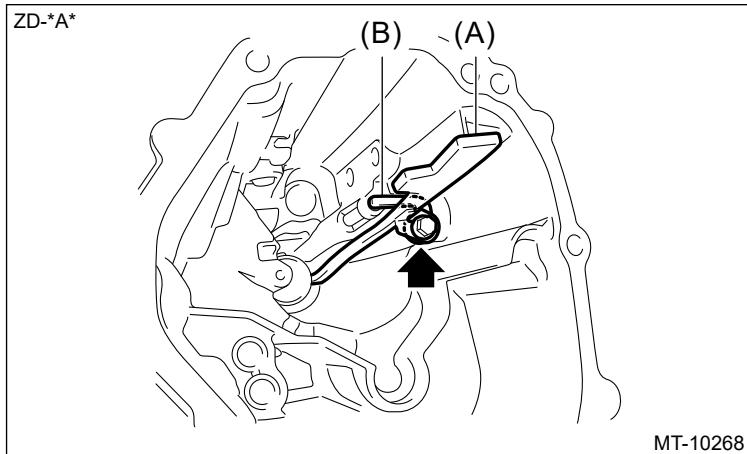
When removing the oil seal, place a cloth onto the extension case to avoid damaging it.



4. Remove the oil guide No. 2.



5. Remove the oil guide No. 1 (A) and stopper plate (B).



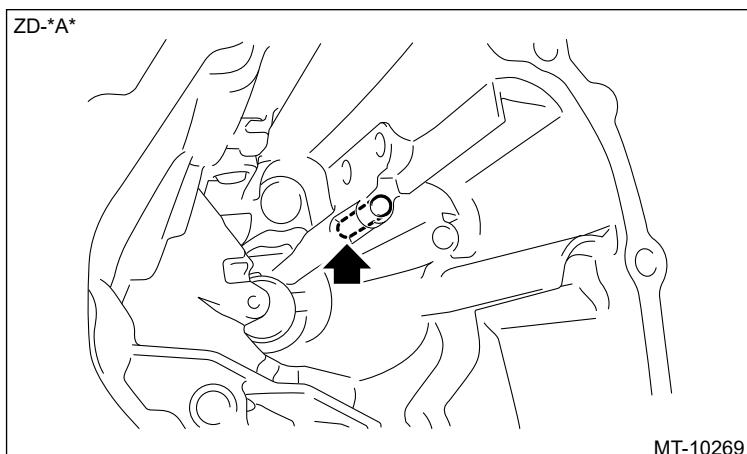
6. Remove the straight pin.



MANUAL TRANSMISSION > Extension Case

ASSEMBLY

1. Install the straight pin.



2. Install the oil guide No. 1 (A) and stopper plate (B).

Caution:

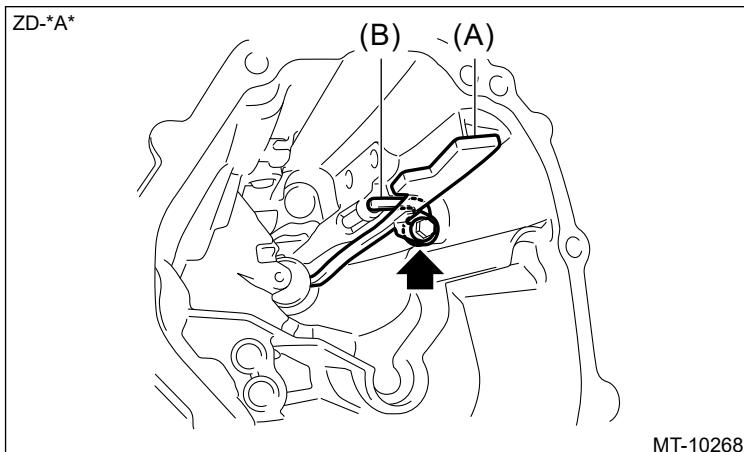
Always use a new bolt.

Note:

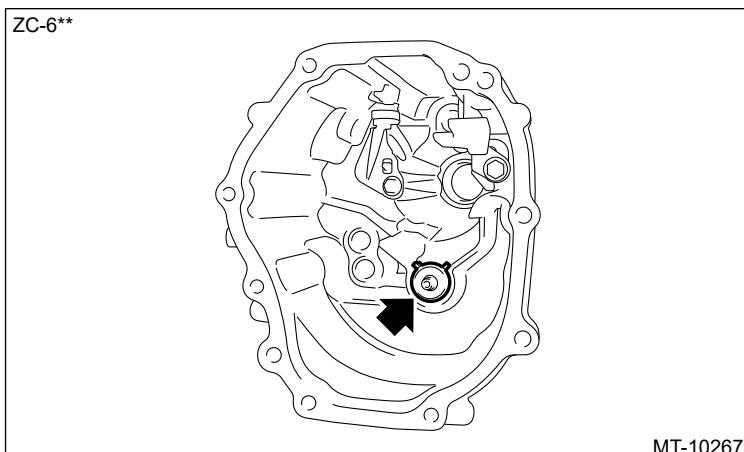
Make sure the end of the oil guide No. 1 is inserted in the groove.

Tightening torque:

8.5 N·m (0.9 kgf-m, 6.3 ft-lb)



3. Install the oil guide No. 2.



4. Using the ST, install a new extension case oil seal.

Caution:

Be careful not to damage the extension case oil seal lip.

Note:

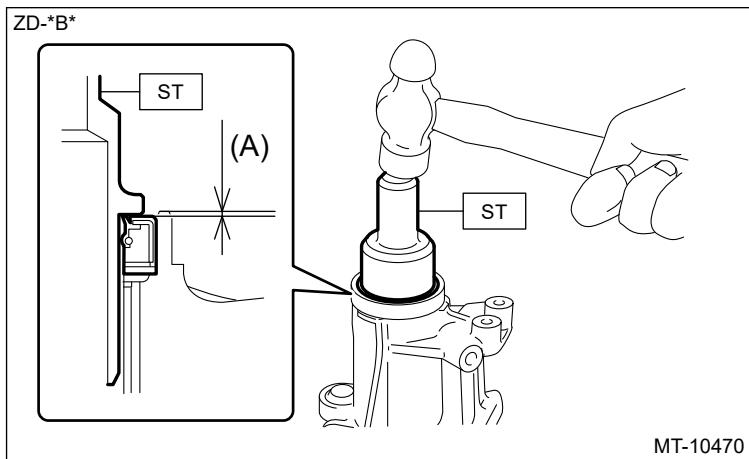
Apply transmission gear oil to the lip section of the extension case oil seal.

Preparation tool:

ST: TRANSMISSION OIL PLUG (09325-20010)

Insertion depth from the end surface of the extension case:

0.1 — 1.1 mm (0.004 — 0.043 in)



(A) 0.1 — 1.1 mm (0.004 —
0.043 in)

5. Install the dust cover using ST1 and ST2.

Caution:

Always use a new dust cover.

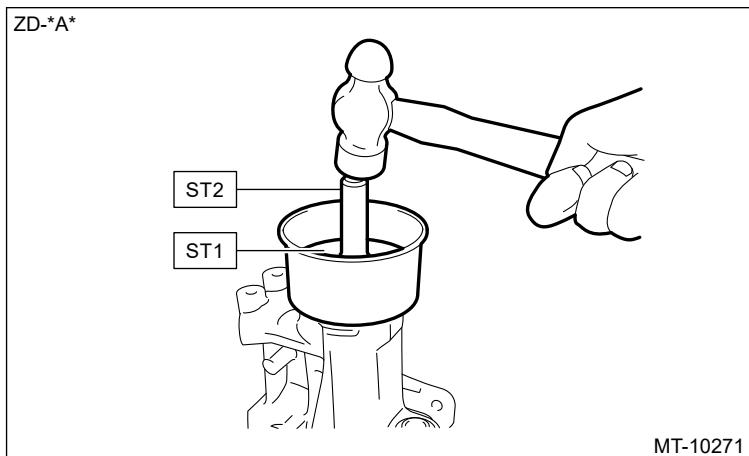
Note:

Strike until you make contact with the extension case.

Preparation tool:

ST1: REPLACER 75 (09951-00750)

ST2: HANDLE 100 (09951-07100)



6. Install a new oil seal using ST.

Caution:

Be careful not to damage the oil seal lip.

Note:

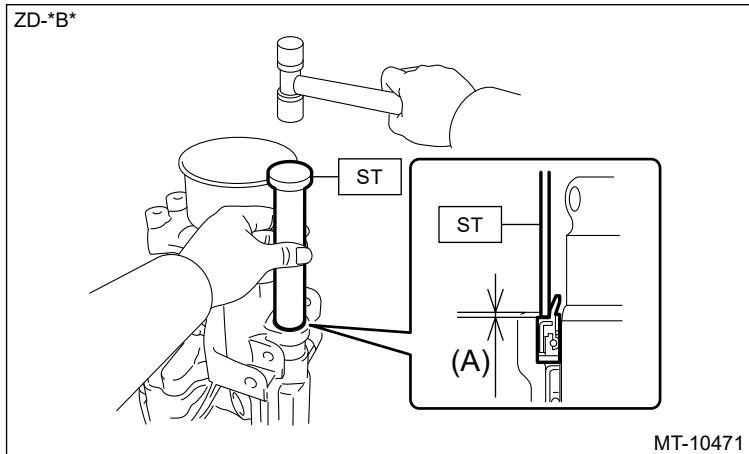
Apply transmission gear oil to the oil seal lips.

Preparation tool:

ST: INSTALLER (18657AA040)

Insertion depth from the end surface of the extension case:

1.0 — 2.0 mm (0.04 — 0.08 in)



(A) 1.0 – 2.0 mm (0.04 – 0.08
in)

MANUAL TRANSMISSION > Extension Case

INSPECTION

Check that there is no deformation, cracks or other damages.

MANUAL TRANSMISSION > Transmission Case

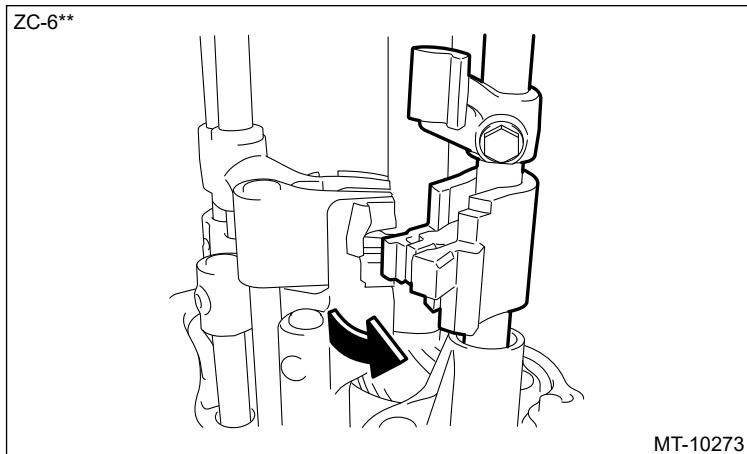
REMOVAL



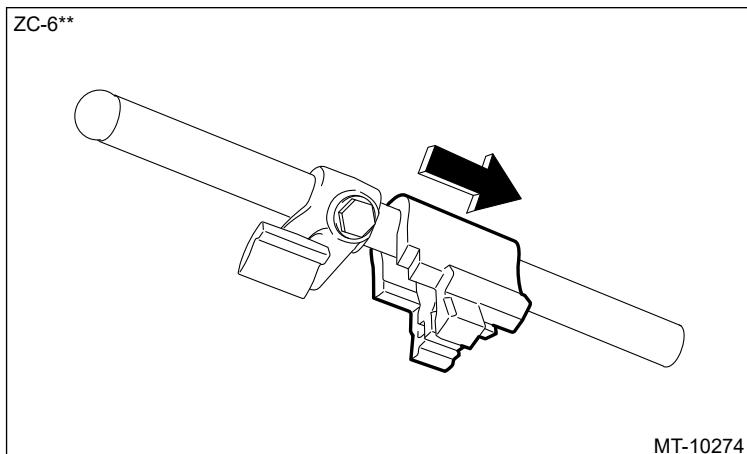
1. Remove the extension case. Ref. to MANUAL TRANSMISSION>Extension Case>**REMOVAL**.

2. Remove the shift shaft and shift block.

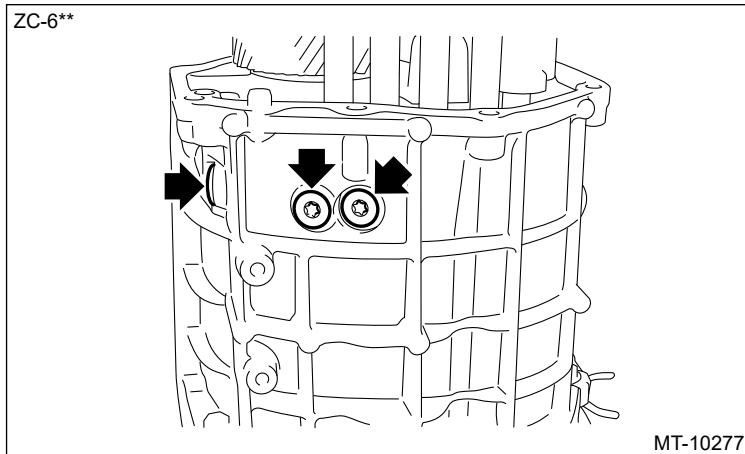
(1) Slide the shift block, and then remove the shift shaft and shift block as a unit.



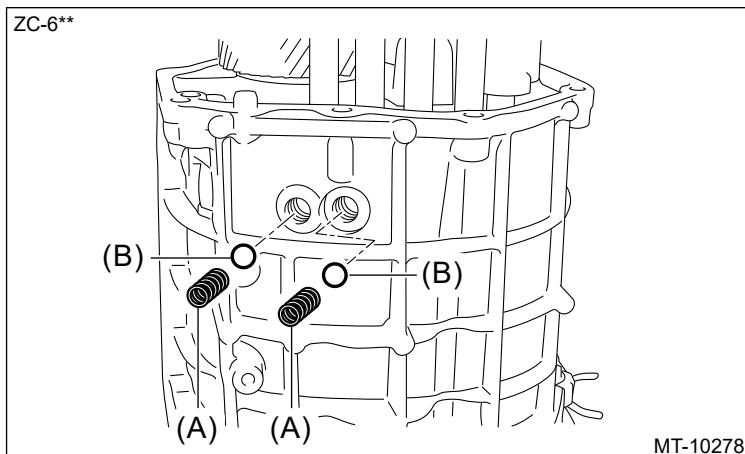
(2) Remove the shift block.



3. Remove the head straight screw plug.



4. Remove the compression springs and balls.



(A) Compression spring

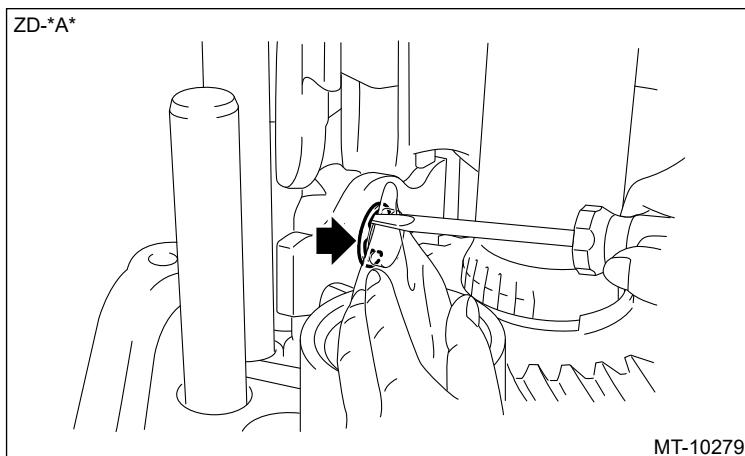
(B) Ball

5. Remove the shift arm.

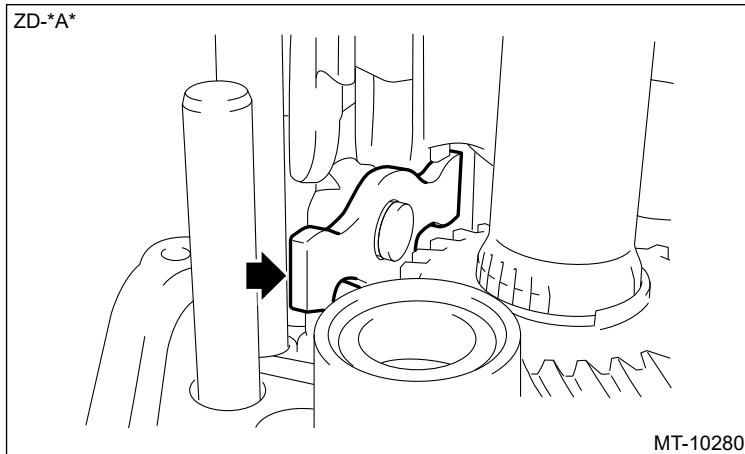
(1) Remove the E-ring.

Caution:

Make sure the E-ring does not pop out.



(2) Remove the shift arm.

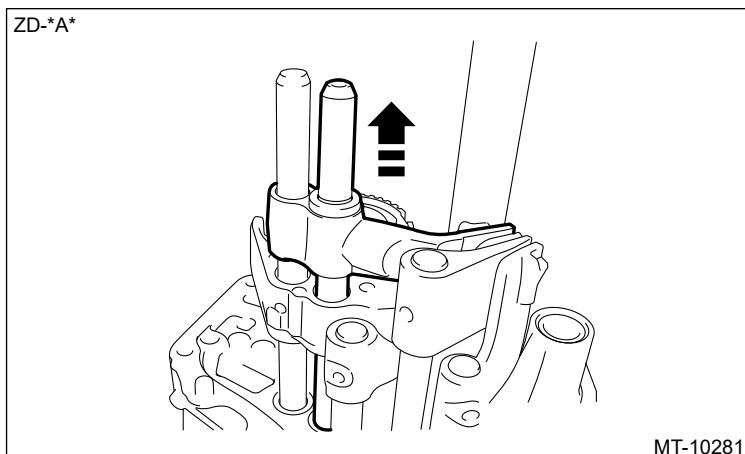


6. Remove the gear shift fork rod No. 4 and gear shift head No. 5.

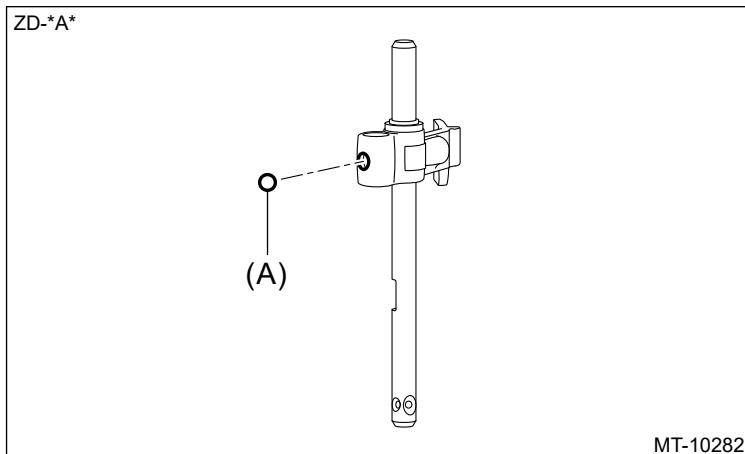
(1) Remove the gear shift fork rod No. 4 and gear shift head No. 5 as a unit.

Caution:

- **Make sure the ball on the gear shift fork rod No. 5 side of the gear shift head No. 5 does not pop out.**
- **Be careful not to let the balls on the transmission case side fall into the transmission case.**

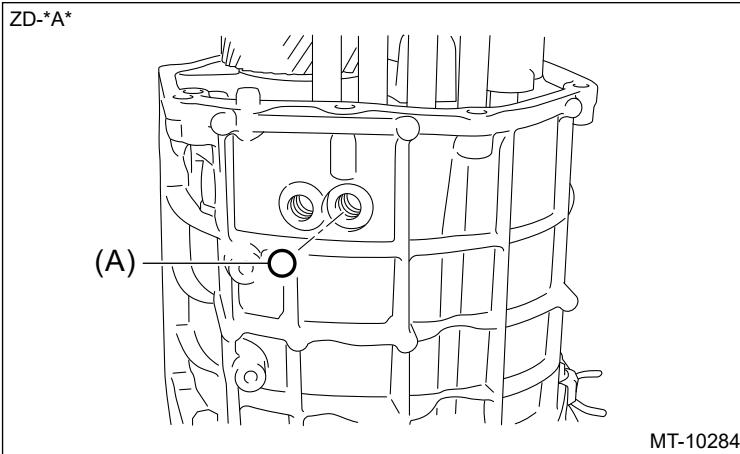


(2) Remove the ball on the gear shift fork rod No. 5 side of the gear shift head No. 5.



(A) Ball

(3) Remove the ball on the transmission case side.



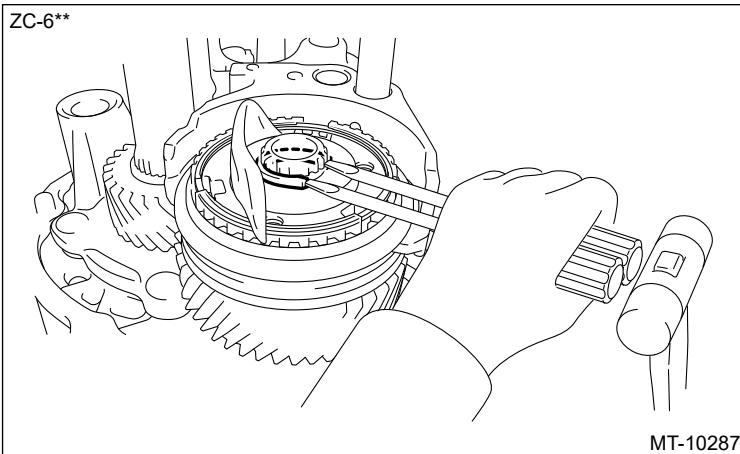
(A) Ball

7. Remove the clutch hub No. 4.

(1) Remove the snap ring.

Caution:

Make sure the snap ring does not pop out.



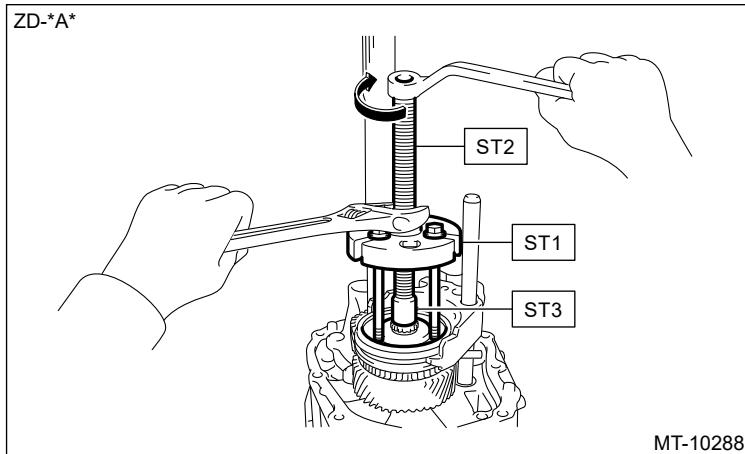
(2) Use the ST1, ST2, and ST3 to remove the clutch hub No. 4, hub sleeve No. 4, gear shift fork No. 4, and gear shift fork rod No. 5 as a unit.

Preparation tool:

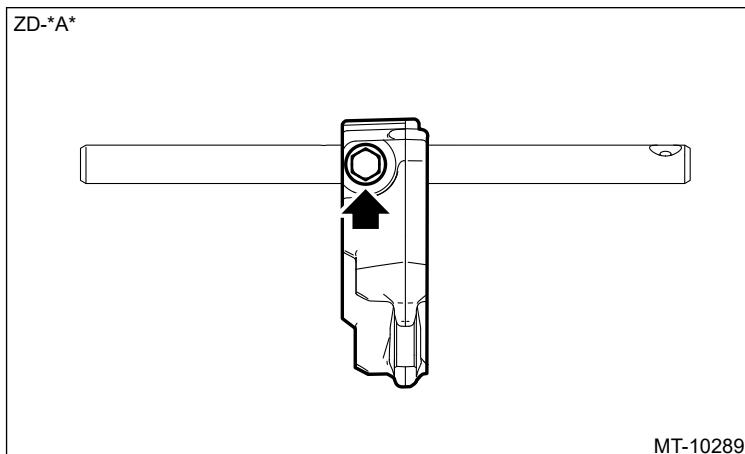
ST1: UPPER PLATE (09951-03010)

ST2: CENTER BOLT (09953-03010)

ST3: ADAPTER 16 (09956-03010)

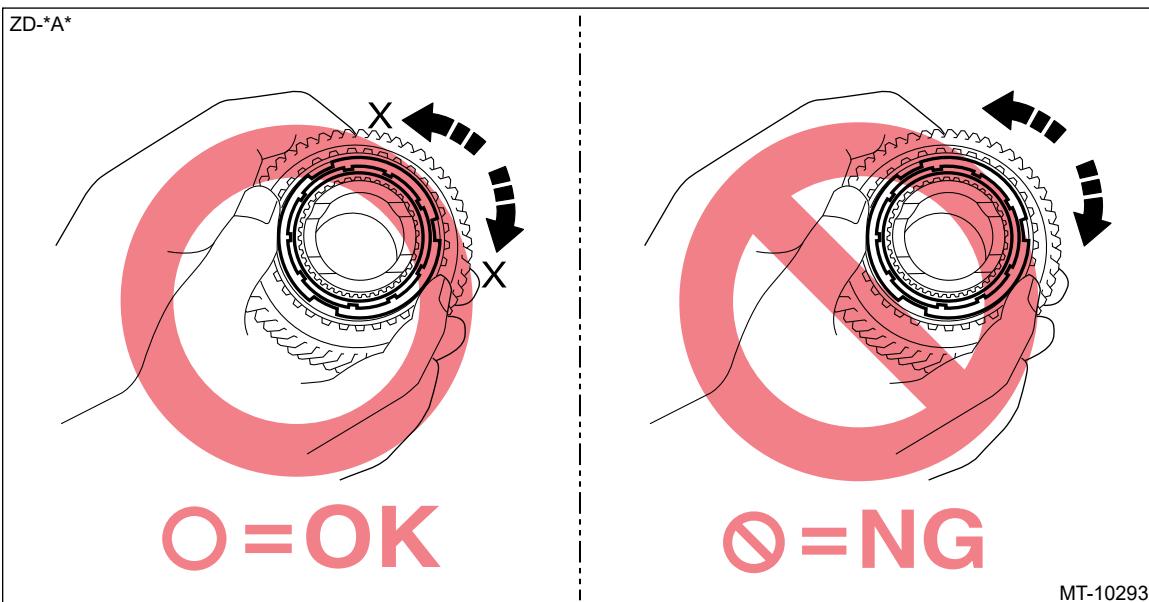


8. Remove the gear shift fork No. 4.

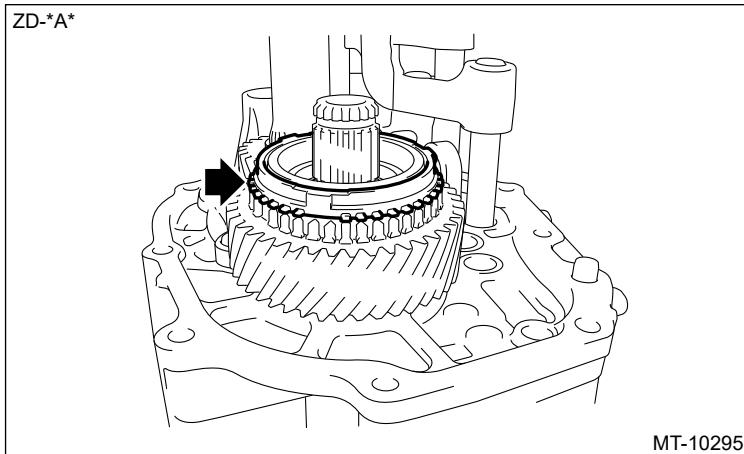


9. Remove the synchronizer ring No. 2.

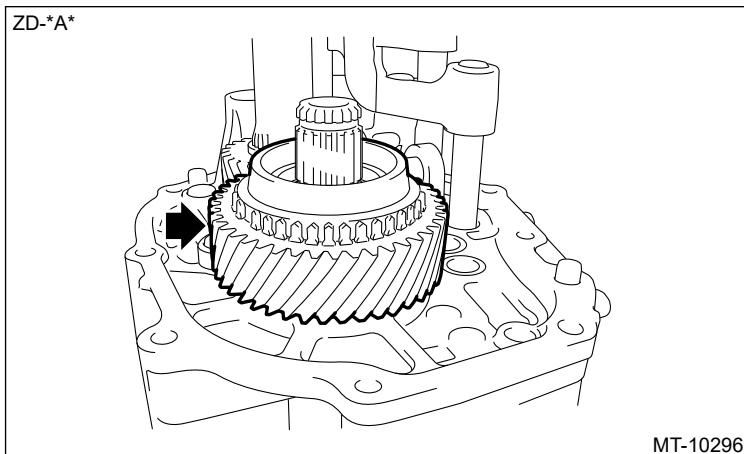
- (1) Apply transmission gear oil to the tapered cone portion of the 6th gear.
 - (2) Press the synchronizer ring No. 2 against the 6th gear with your hand and perform the following checks.
- 1) Confirm that the parts do not turn in the rotational directions.



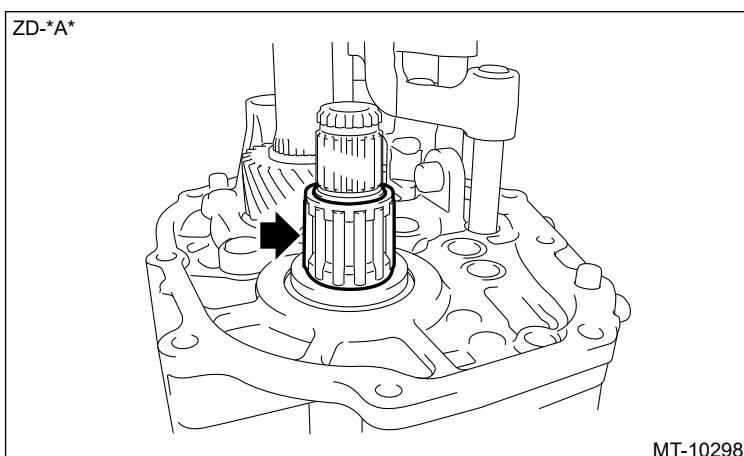
- 2) If they do, replace the synchronizer ring No. 2 and 6th gear with new ones.
- (3) Remove the synchronizer ring No. 2.



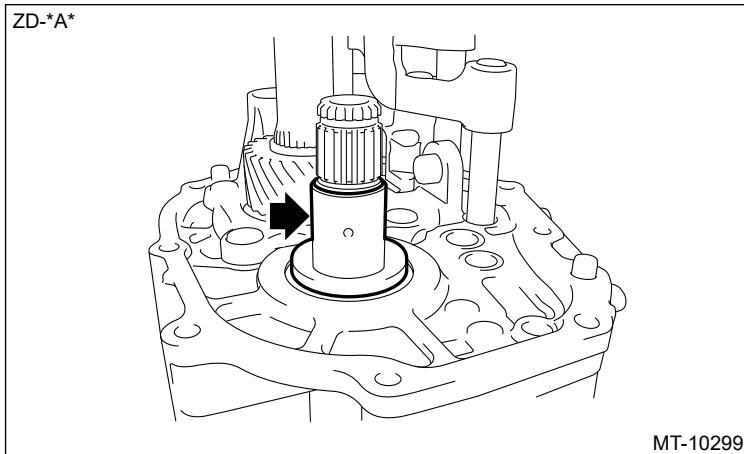
10. Remove the 6th gear.



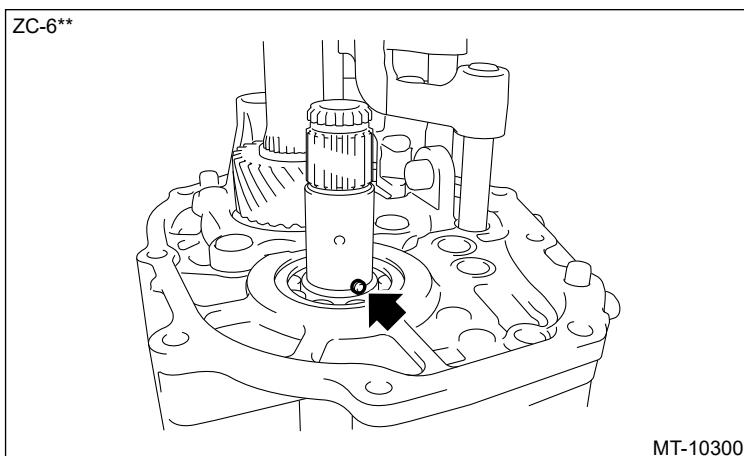
11. Remove the thrust needle roller bearing.



12. Remove the 6th gear bearing inner race.



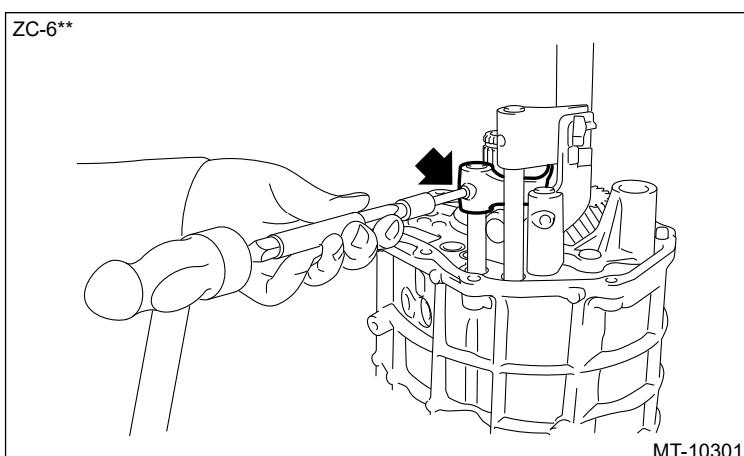
13. Remove the ball.



14. Remove the spring pin, and then remove the gear shift head No. 2.

Caution:

- Make sure the spring pin does not pop out.
- Be careful not to drop the spring pin into the transmission case.

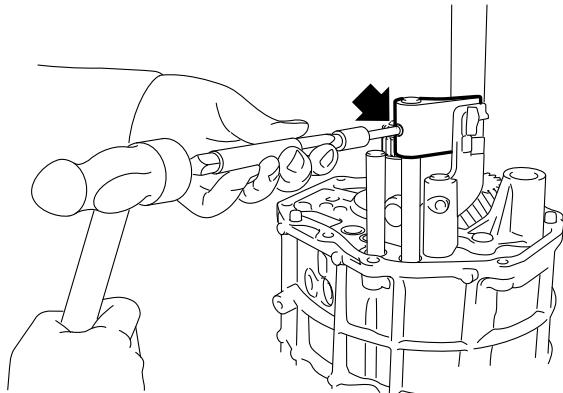


15. Remove the spring pin, and then remove the gear shift head No. 1.

Caution:

- Make sure the spring pin does not pop out.
- Be careful not to drop the spring pin into the transmission case.
- Check the direction of the parts before removing them.

ZC-6**

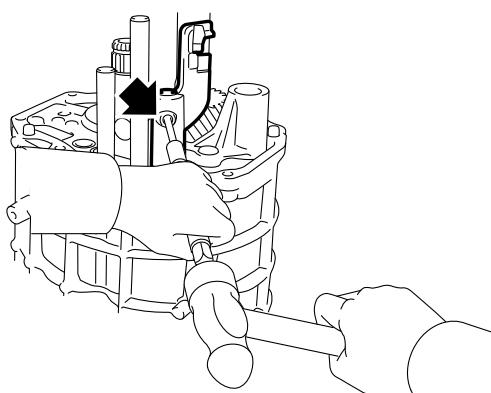


MT-10303

16. Remove the spring pin, and then remove the gear shift head No. 3.**Caution:**

- Make sure the spring pin does not pop out.
- Be careful not to drop the spring pin into the transmission case.

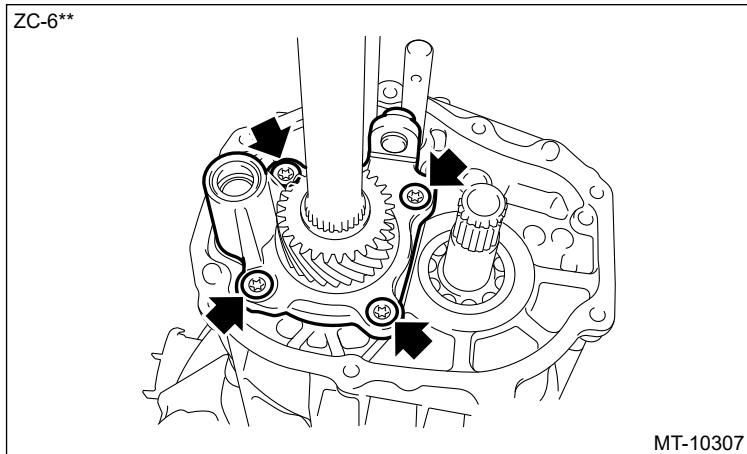
ZC-6**



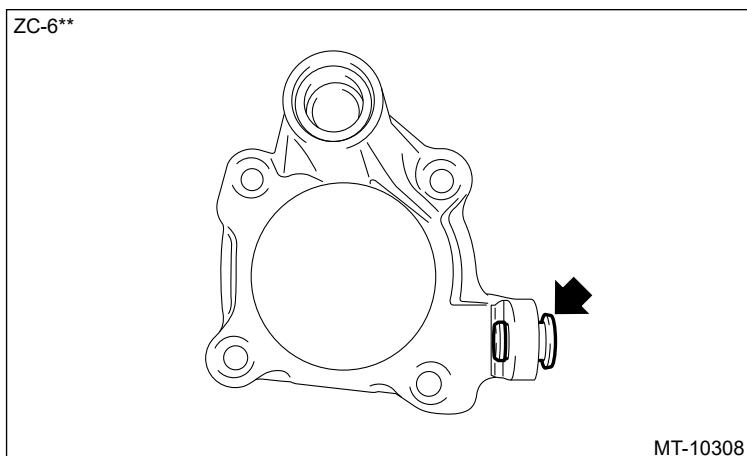
MT-10305

17. Remove the rear bearing retainer.

(1) Remove the rear bearing retainer.

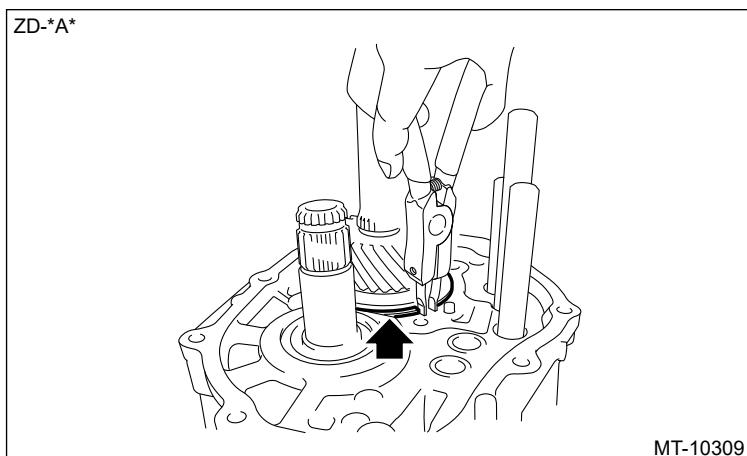


(2) Remove the shift arm pivot.

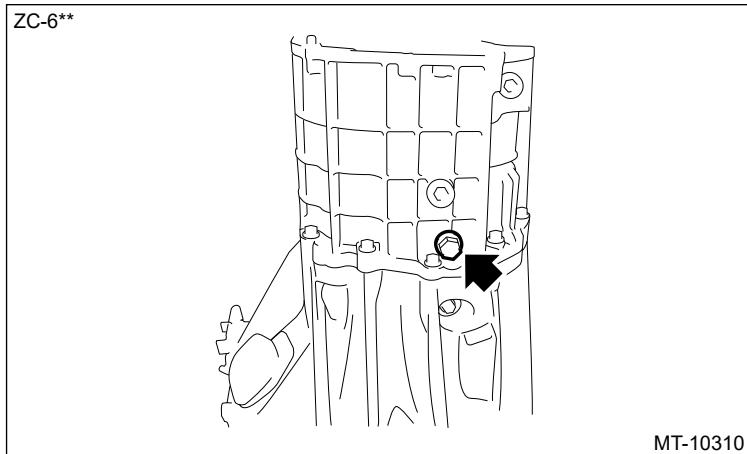


18. Remove the transmission case.

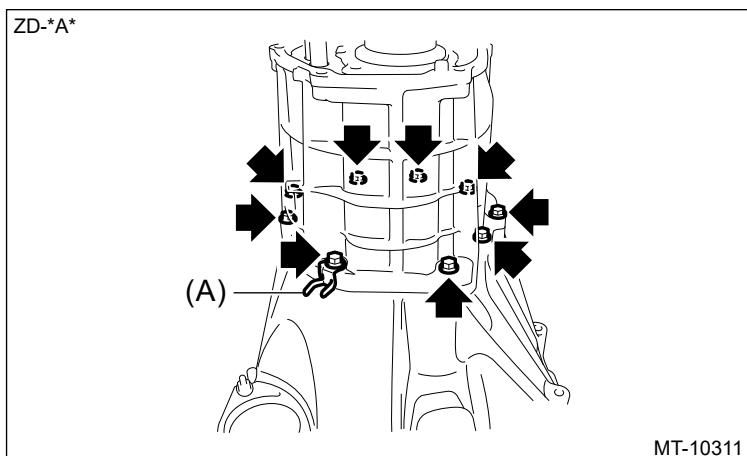
(1) Remove the snap ring.



(2) Remove the reverse idler gear shaft securing bolt. (Transmission case side)



(3) Remove the bolts securing the transmission case and clamp (A).



(4) Using a plastic hammer, expand the clearance and remove the transmission case.

Caution:

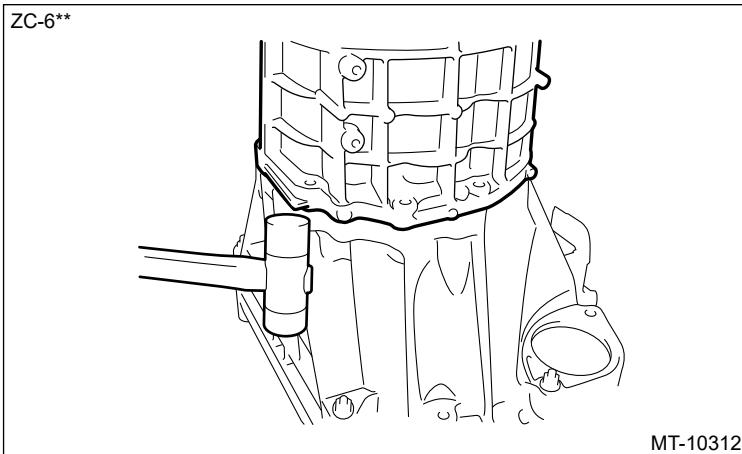
Be careful not to damage the transmission case.

Note:

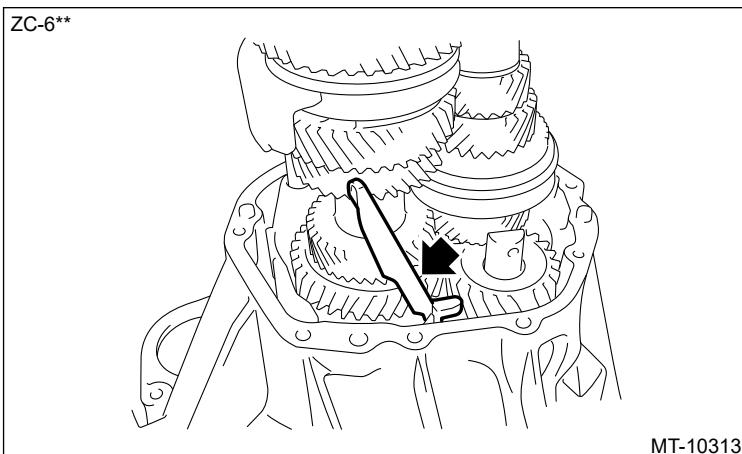
Make sure that the damping material (a) has not come off.

If it has come off, replace the transmission case with a new one.





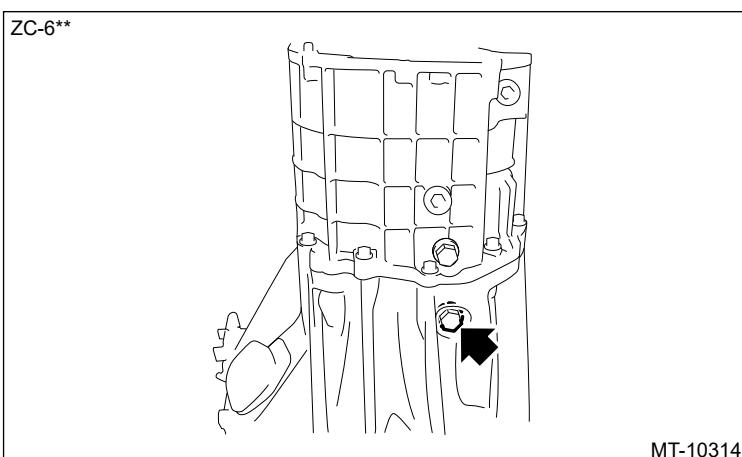
19. Remove the oil receiver pipe.



20. Loosen the bolt securing the reverse idler gear shaft of the clutch housing. (Clutch housing side)

Note:

Perform this step only if the reverse idler gear is not removed.



21. Remove the liquid gasket from the transmission case and clutch housing.

MANUAL TRANSMISSION > Transmission Case

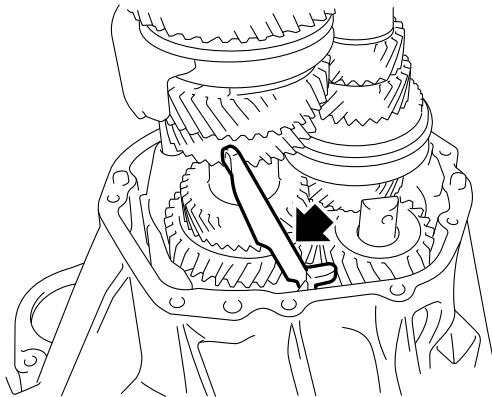
INSTALLATION

1. Install the oil receiver pipe.

Caution:

Check that the tip of the oil receiver pipe is not lifted or disconnected.

ZC-6**



MT-10313

2. Temporarily install the reverse idler gear shaft.

Note:

Perform this step only if the reverse idler gear has not been removed.

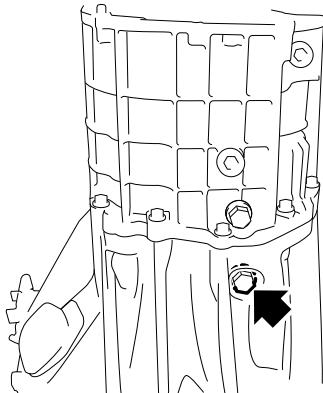
(1) Remove the bolts and gasket. (Clutch housing side)

(2) Temporarily install the reverse idler gear shaft securing bolts using a new gasket. (Clutch housing side)

Caution:

Always use a new bolt.

ZC-6**



MT-10314

3. Install the transmission case.

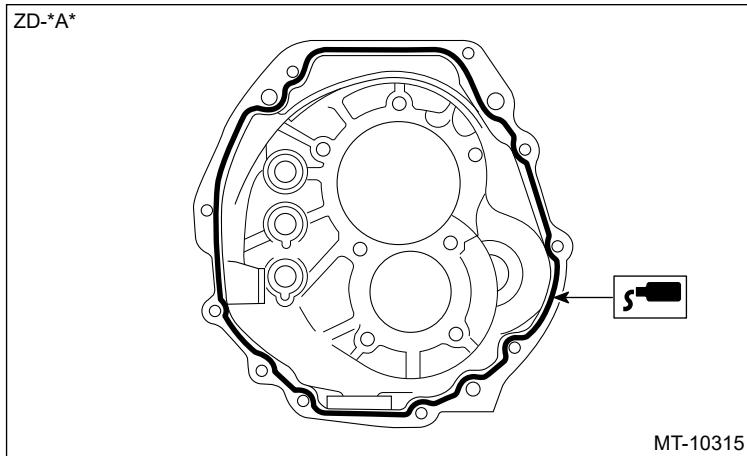
(1) Apply liquid gasket to the mating surface of the transmission case as shown in the figure.

Note:

- Before applying liquid gasket, degrease the old liquid gasket seal surface of the transmission case and clutch housing.
- Install within 10 min. after applying liquid gasket.

Preparation items:

Liquid gasket: THREE BOND 1281 or equivalent



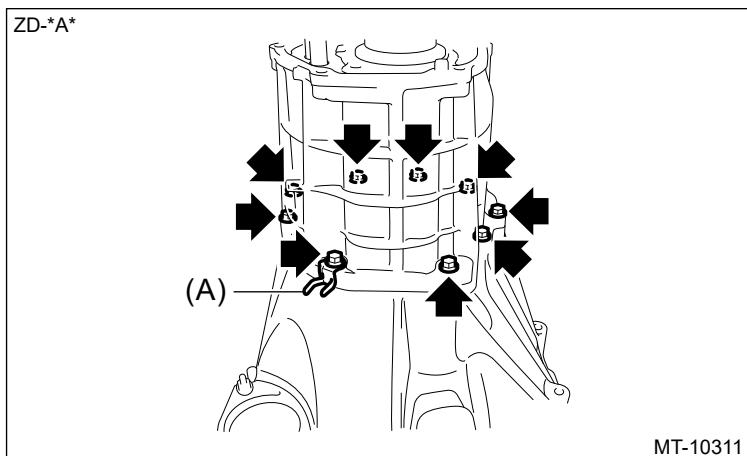
- (2) Tighten the transmission case and the clamp (A).

Caution:

Always use a new bolt.

Tightening torque:

29 N·m (3.0 kgf-m, 21.4 ft-lb)



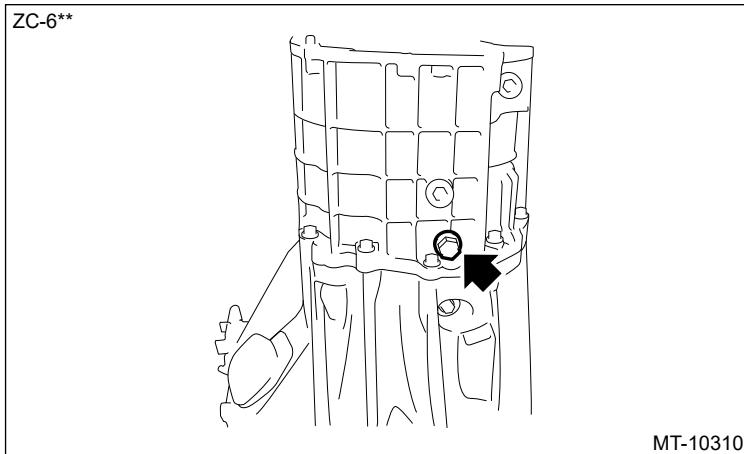
4. Install the reverse idler gear shaft securing bolts using a new gasket. (Transmission case side)

Caution:

Always use a new bolt.

Tightening torque:

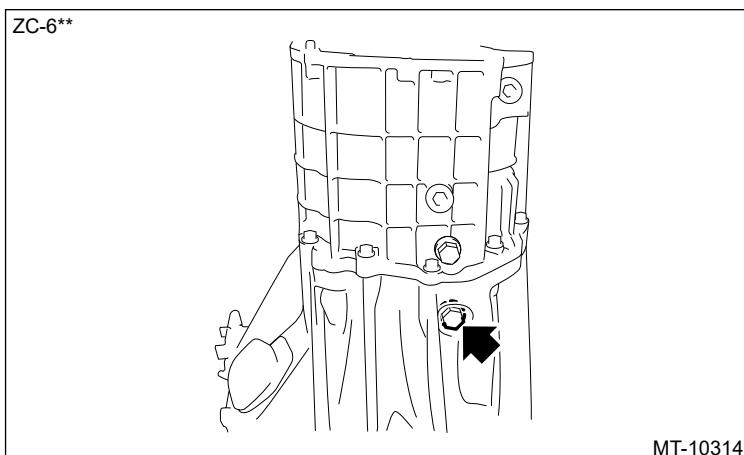
28 N·m (2.9 kgf-m, 20.7 ft-lb)



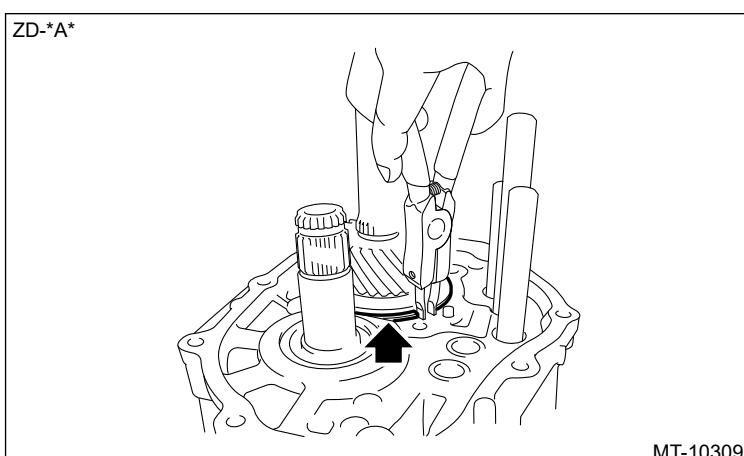
5. Tighten the reverse idler gear shaft securing bolt. (Clutch housing side)

Tightening torque:

28 N·m (2.9 kgf-m, 20.7 ft-lb)



6. Install a new snap ring.



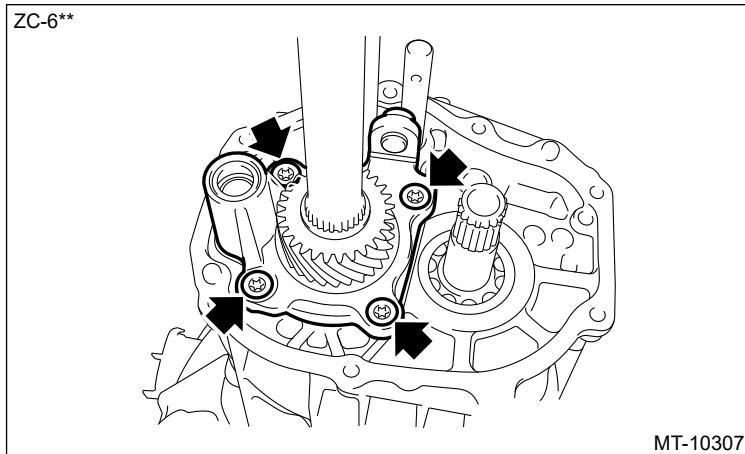
7. Install the rear bearing retainer.

Caution:

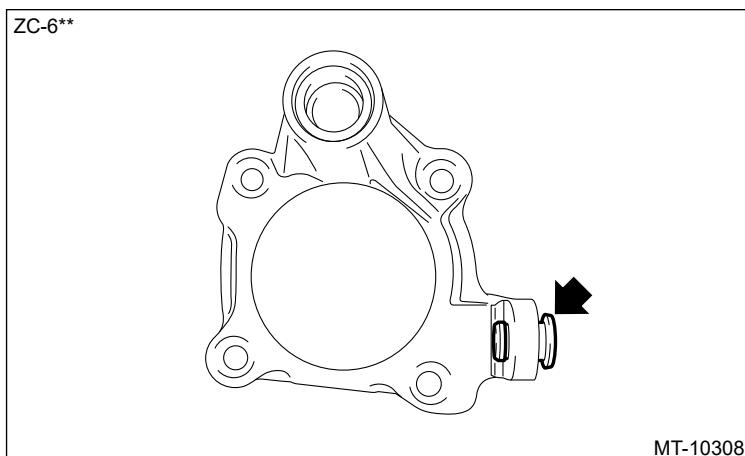
Always use a new bolt.

Tightening torque:

30 N·m (3.1 kgf-m, 22.1 ft-lb)



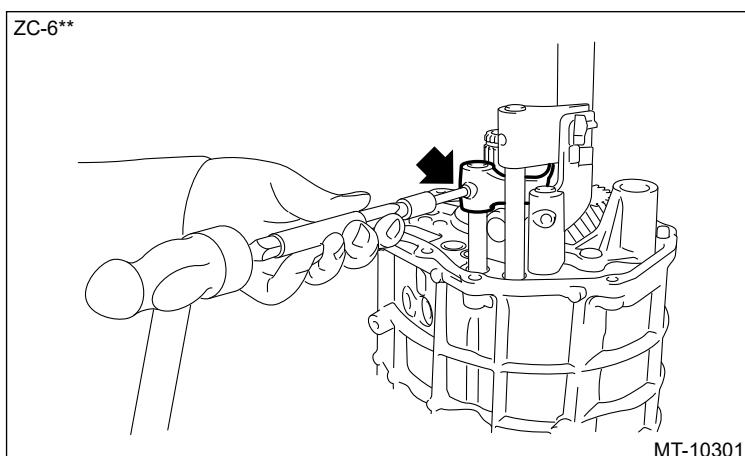
- 8.** Install the shift arm pivot.



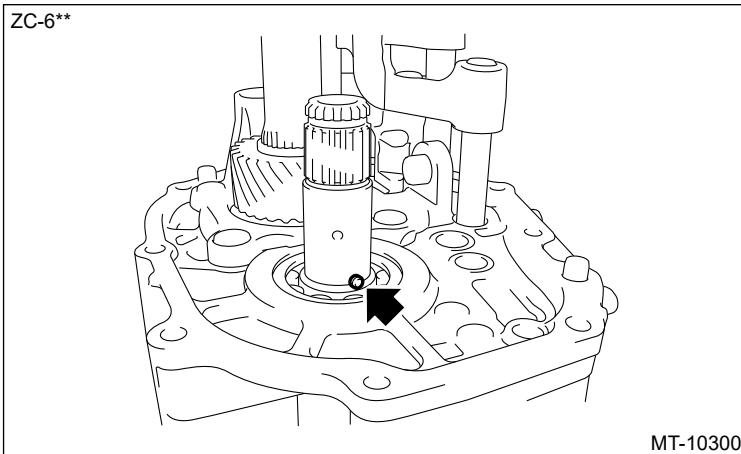
- 9.** Using a new spring pin, install the gear shift head No. 2.

Spring pin insertion depth (from the end face of the gear shift head No. 2):

0 mm (0 in)



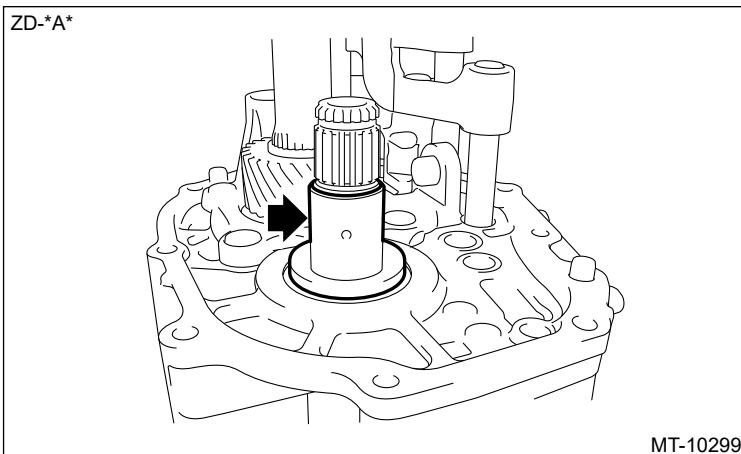
- 10.** Install the ball.



11. Install the 6th gear bearing inner race.

Note:

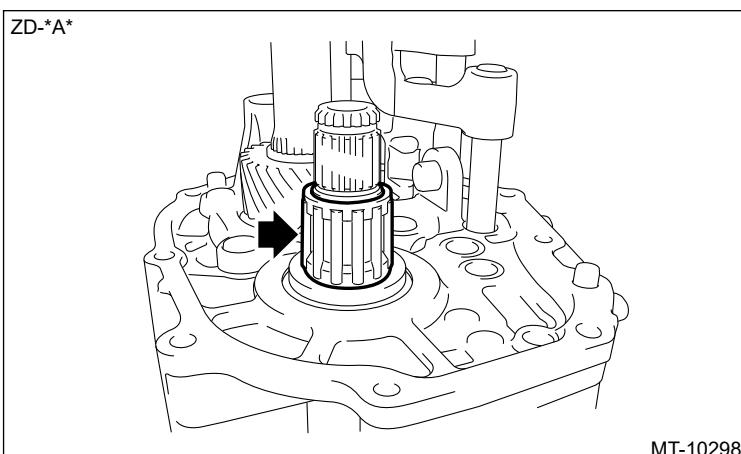
Apply transmission gear oil to the 6th gear bearing inner race.



12. Install the needle roller bearing.

Note:

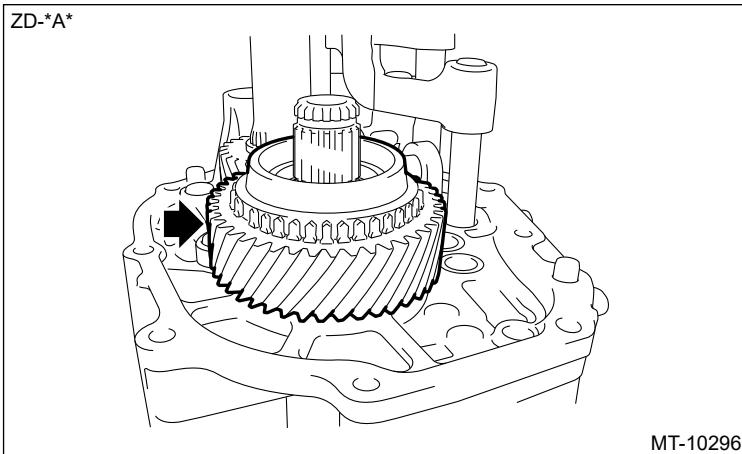
Apply transmission gear oil to the needle roller bearing.



13. Install the 6th gear.

Note:

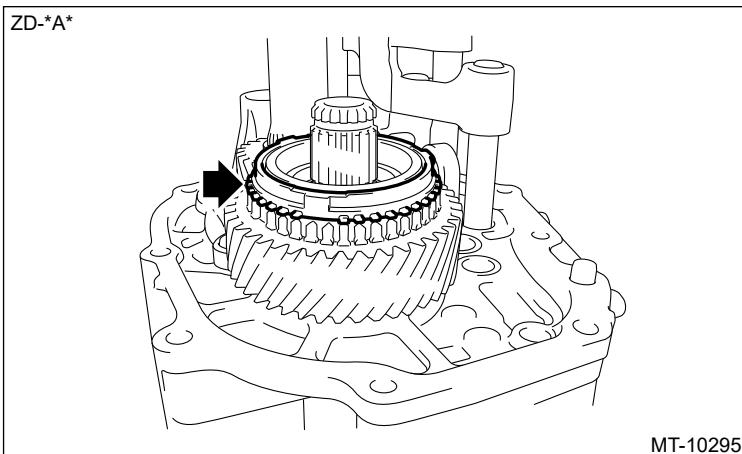
Apply transmission gear oil to the 6th gear.



14. Install the synchronizer ring No. 2.

Note:

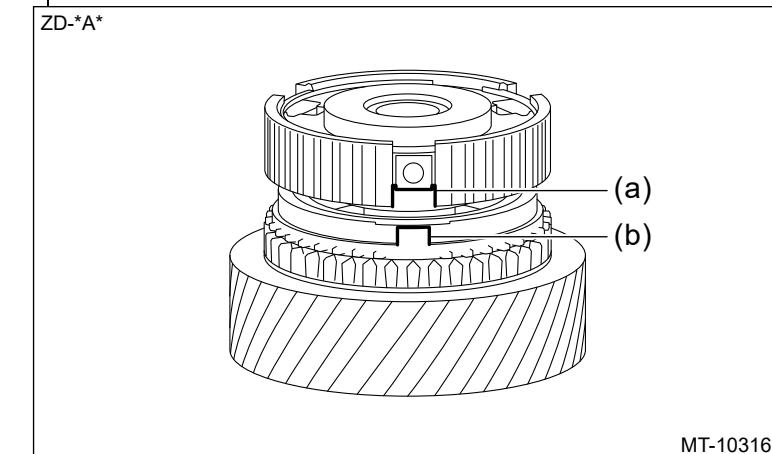
Apply transmission gear oil to the synchronizer ring No. 2.



15. Use the ST to install the clutch hub No. 4, hub sleeve No. 4, gear shift fork No. 4, and gear shift fork rod No. 4 as a unit.

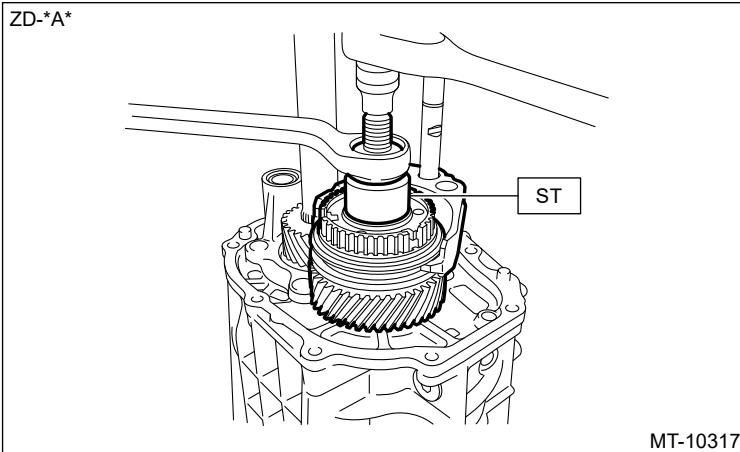
Caution:

Align the key groove (a) of the clutch hub No. 4 with the protrusion (b) of the synchronizer ring No. 2.



Preparation tool:

ST: INSTALLER (18682AA000)

**16.** Install the snap ring.

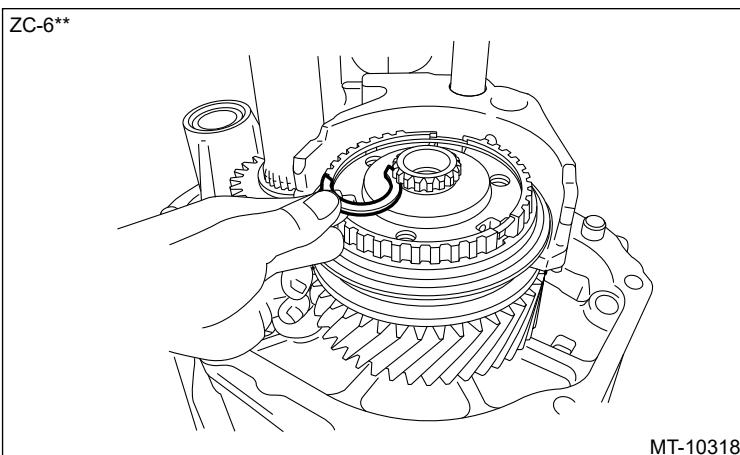
- (1) Select a suitable snap ring so that the clearance between the clutch hub No. 4 and snap ring is within the specified value.

Note:

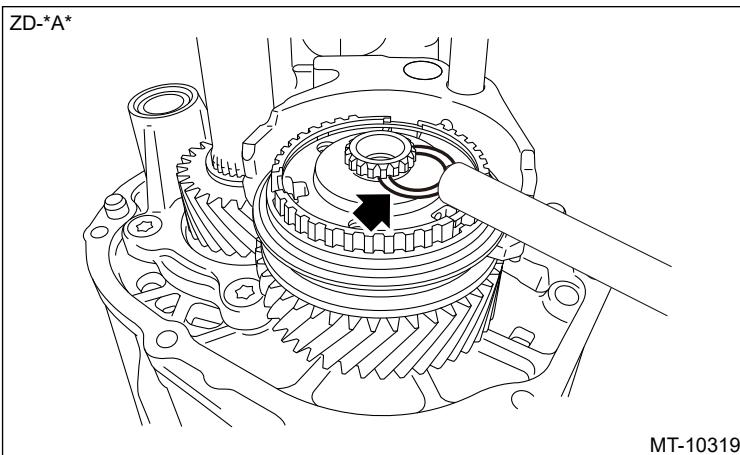
- Select the thickest one that can be installed.
- The snap ring is a non-reusable part.

Specification:

0 – 0.1 mm (0 – 0.004 in)



- (2) Install the selected snap ring.



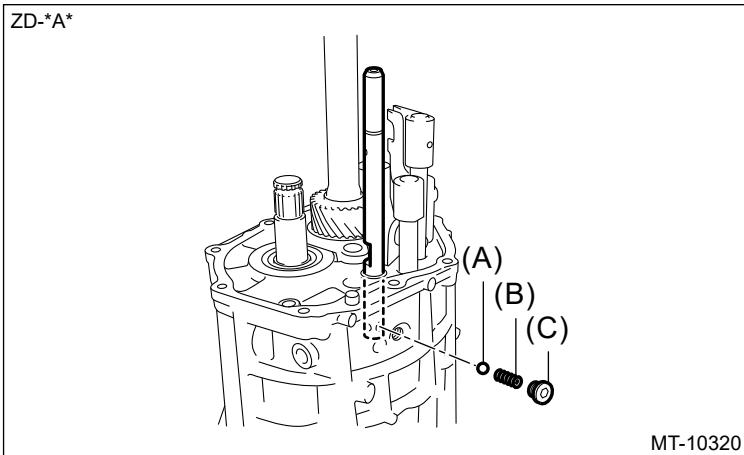
17. Install the balls, compression spring, and head straight screw plug.

Caution:

Always use a new head straight screw plug.

Tightening torque:

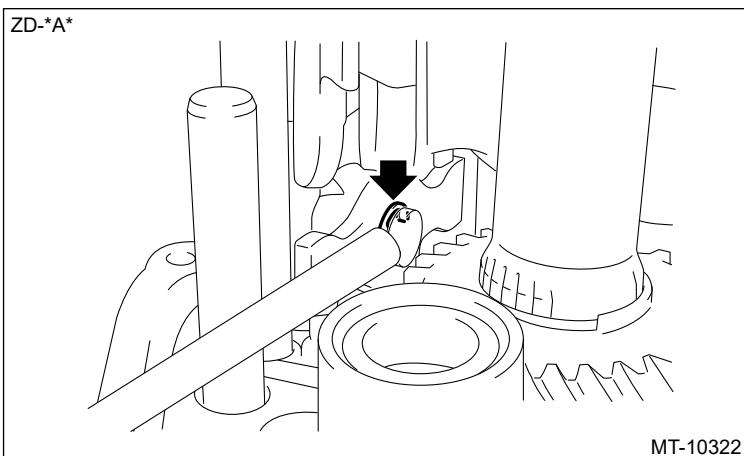
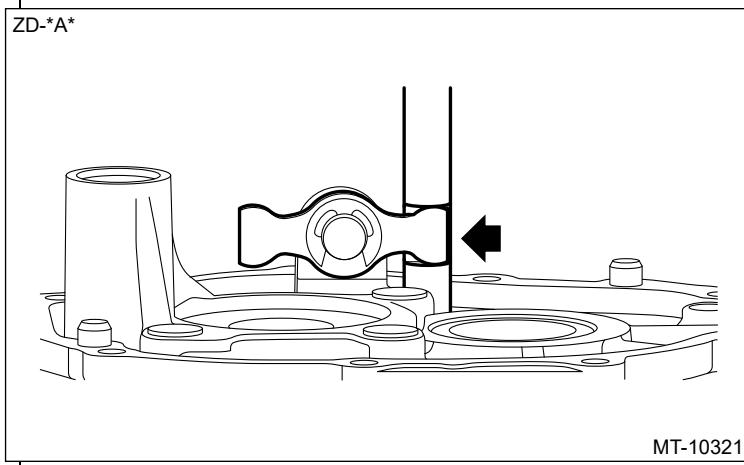
19 N·m (1.9 kgf-m, 14.0 ft-lb)



18. Using a new E-ring, install the shift arm.

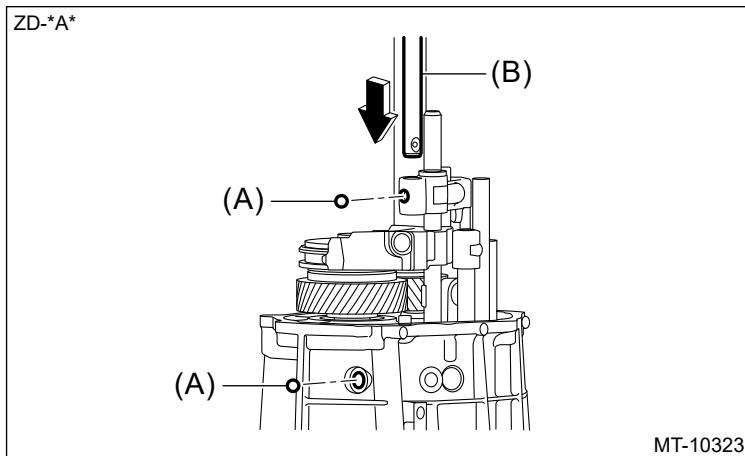
Note:

Align the end of the shift arm with the cutout portion of the gear shift fork rod No. 4.



19. Install the gear shift fork rod No. 5.

- (1) Set the balls (A), and install the gear shift fork rod No. 5 (B).



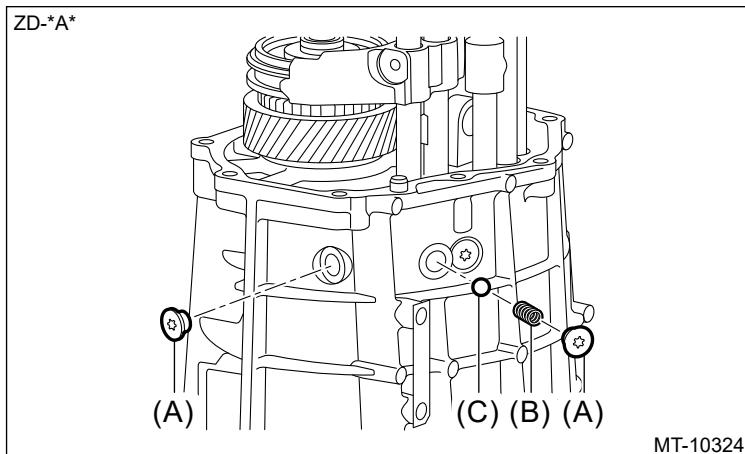
- (2) Install the balls, compression spring, and head straight screw plug.

Caution:

Always use a new head straight screw plug.

Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)



(A) Head straight screw plug

(B) Compression spring

(C) Ball

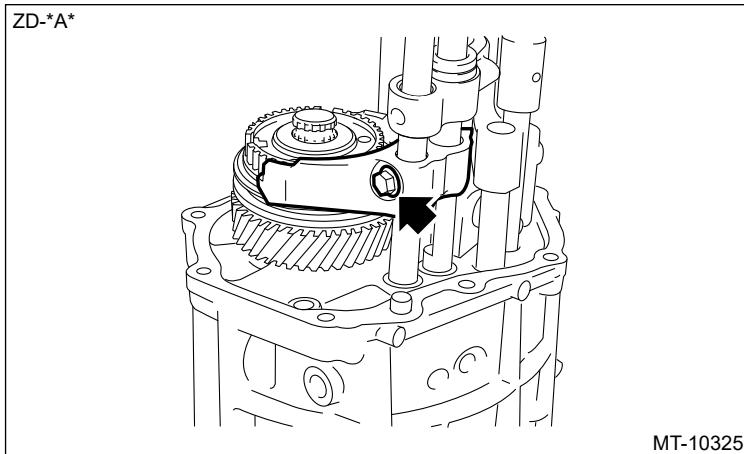
- (3) Install the bolt that secures the gear shift fork rod No. 5.

Caution:

Always use a new bolt.

Tightening torque:

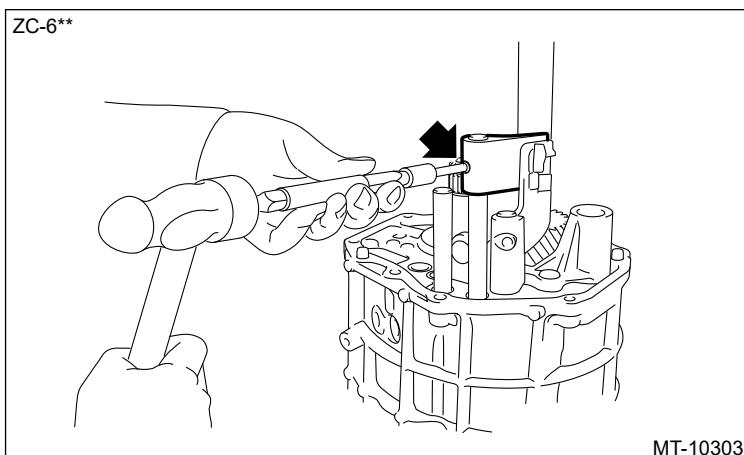
19.5 N·m (2.0 kgf-m, 14.4 ft-lb)



20. Using a new spring pin, install the gear shift head No. 1.

Spring pin insertion depth (from the end face of the gear shift head No. 1):

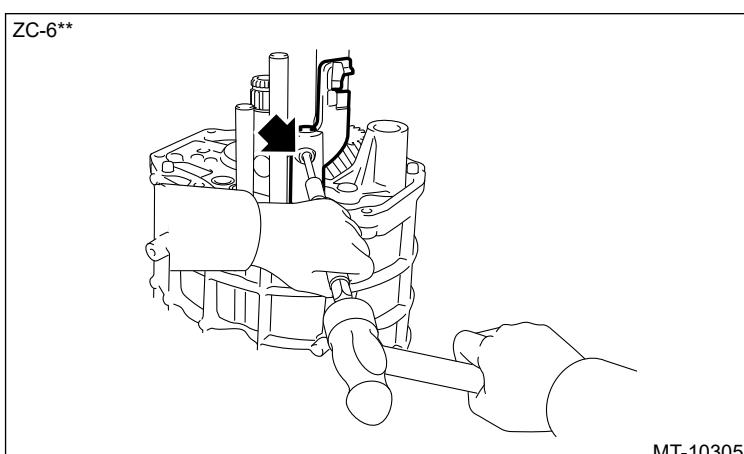
0 mm (0 in)



21. Using a new spring pin, install the gear shift head No. 3.

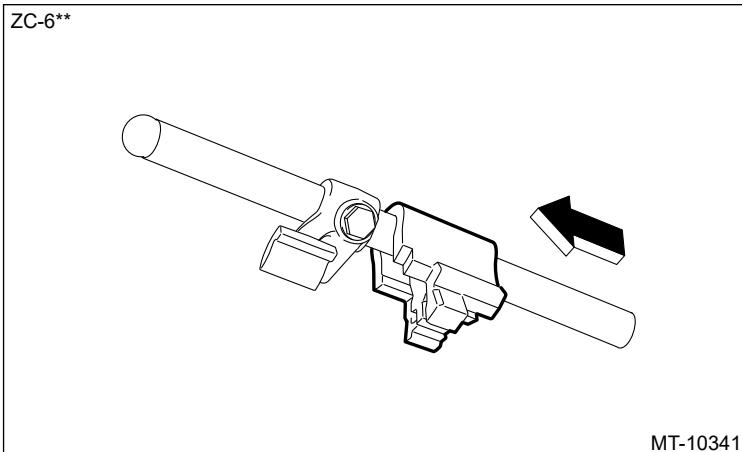
Spring pin insertion depth (from the end face of the gear shift head No. 3):

0 mm (0 in)

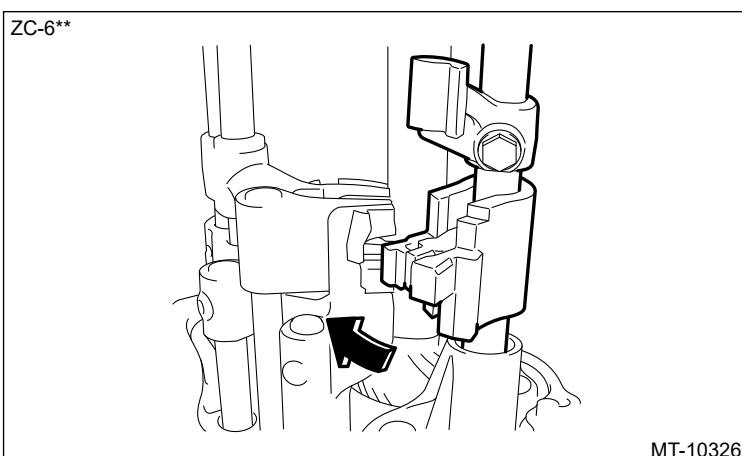


22. Install the shift shaft and shift block.

(1) Install the shift block.



(2) Set the shift shaft and shift block as a unit, and then slide the shift block to install it.



23. Install the extension case.  Ref. to MANUAL TRANSMISSION>Extension Case>INSTALLATION.

MANUAL TRANSMISSION > Transmission Case

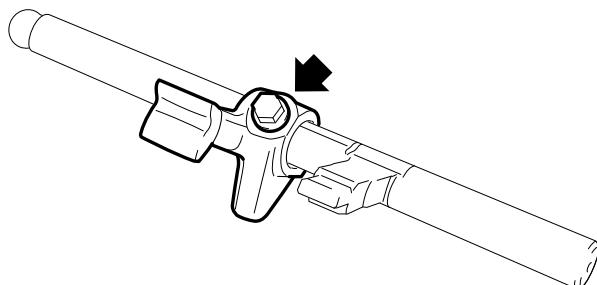
DISASSEMBLY



1. SHIFT SHAFT

1. Remove the shift inner lever FR.

ZC-6**



MT-10327

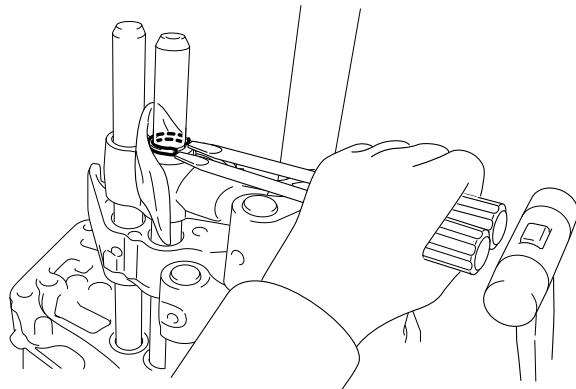
2. GEAR SHIFT FORK ROD NO. 4

1. Remove the snap ring.

Caution:

Make sure the snap ring does not pop out.

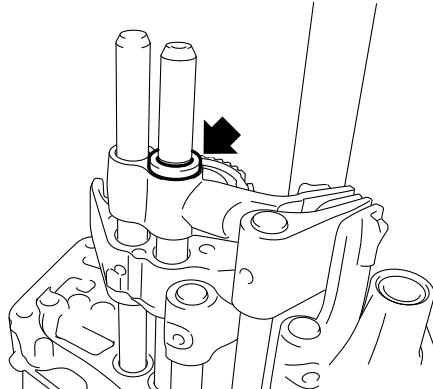
ZC-6**



MT-10328

2. Remove the washer.

ZC-6**

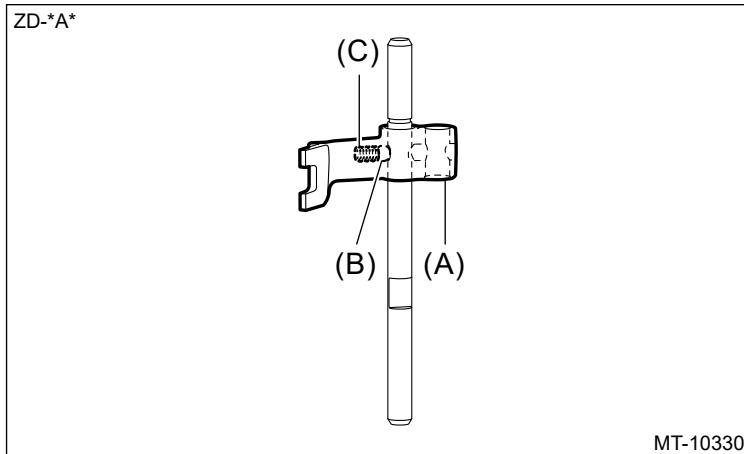


MT-10329

3. Remove the gear shift head No. 5 (A) and compression spring (C).

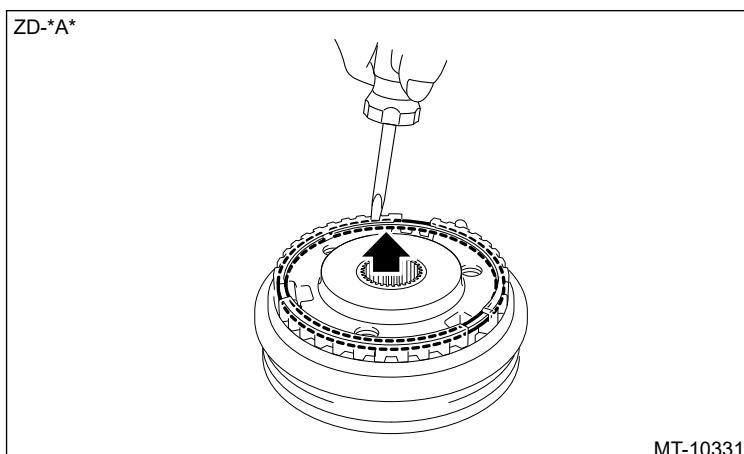
Caution:

Make sure the balls and compression spring do not pop out.



3. CLUTCH HUB NO. 4

1. Remove the snap ring.



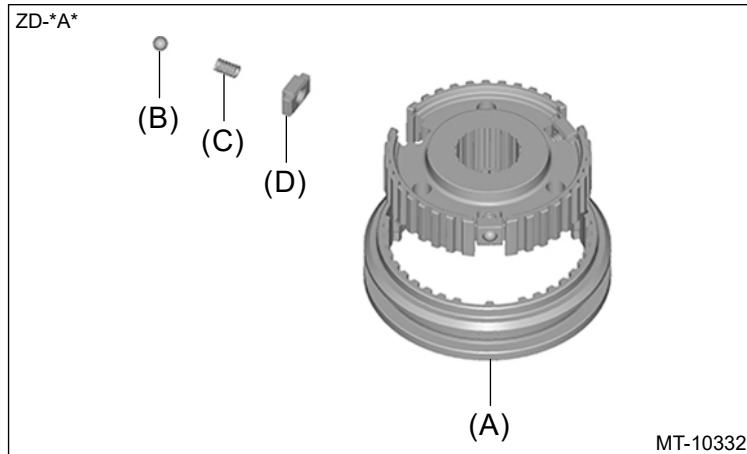
2. Remove the hub sleeve No. 4 (A), and then remove the ball (B), synchromesh shifting key spring No. 1 (C), and synchromesh shifting key No. 1 (D).

Caution:

- Use a cloth to keep the synchromesh shifting key No. 1, synchromesh shifting key spring No. 1, and ball from popping out.
- Be careful not to deform the synchromesh shifting key spring No. 1.
- Check the direction of the parts before removing them.

Note:

Make sure not to change the assembly positions for the hub sleeve No. 4 and synchromesh shifting key No. 1.



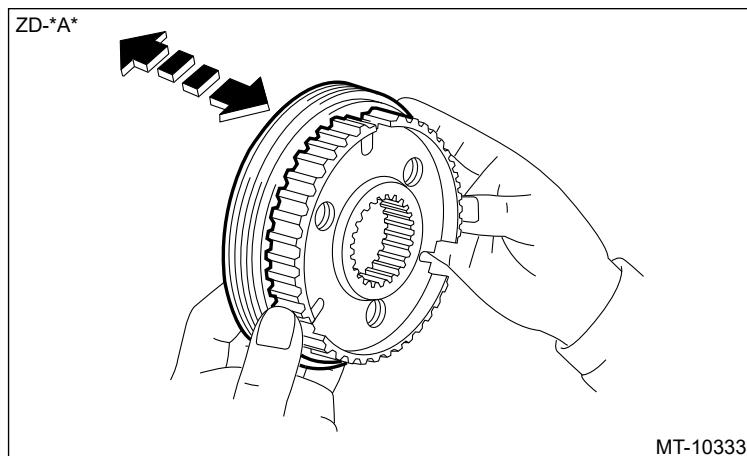
3. Check the hub sleeve No. 4.

(1) Check the end of the spline gear of the hub sleeve No. 4.

If it is worn, replace the hub sleeve No. 4 with a new one.

(2) Install the hub sleeve No. 4 to the clutch hub No. 4, and check that the parts slide smoothly.

If they do not slide smoothly, replace the hub sleeve No. 4 and the clutch hub No. 4 with new ones.



MANUAL TRANSMISSION > Transmission Case

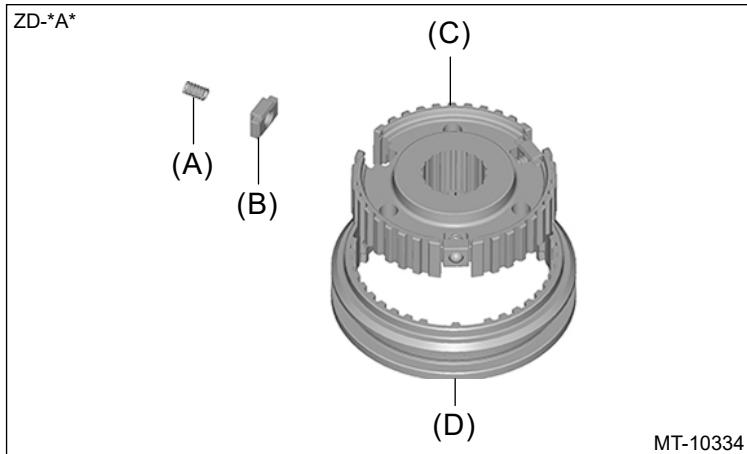
ASSEMBLY

1. CLUTCH HUB NO. 4

- Set the synchromesh shifting key spring No. 1 (A) and synchromesh shifting key No. 1 (B) to the clutch hub No. 4 (C), and install the hub sleeve No. 4 (D).

Note:

Make sure not to change the assembly positions for the hub sleeve No. 4 and synchromesh shifting key No. 1.



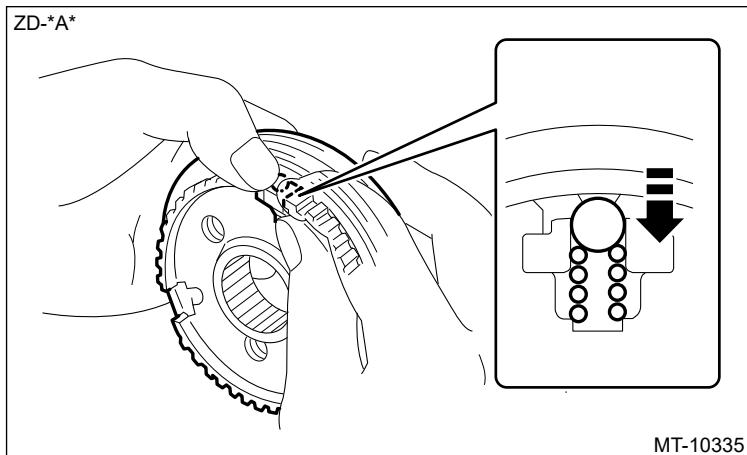
- 2.** Install the ball while pressing the synchromesh shifting key spring No. 1.

Caution:

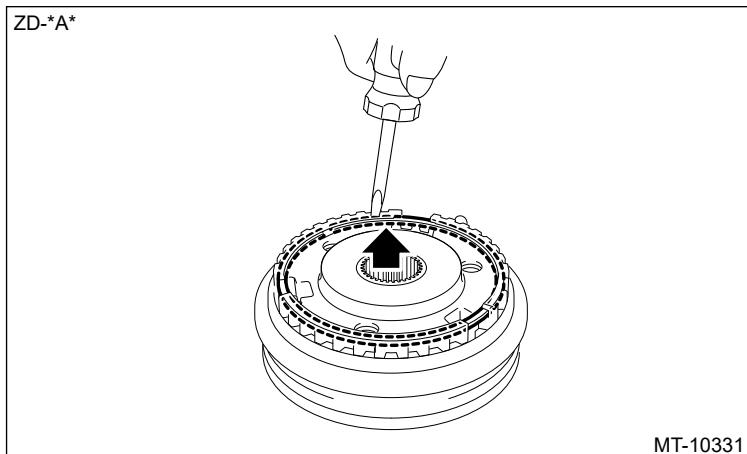
Use vaseline and make sure the ball does not pop out.

Note:

- **Apply transmission gear oil to the sliding area of the clutch hub No. 4.**
- **Secure the synchromesh shifting key spring No. 1.**



- 3.** Install a new snap ring.



2. GEAR SHIFT FORK ROD NO. 4

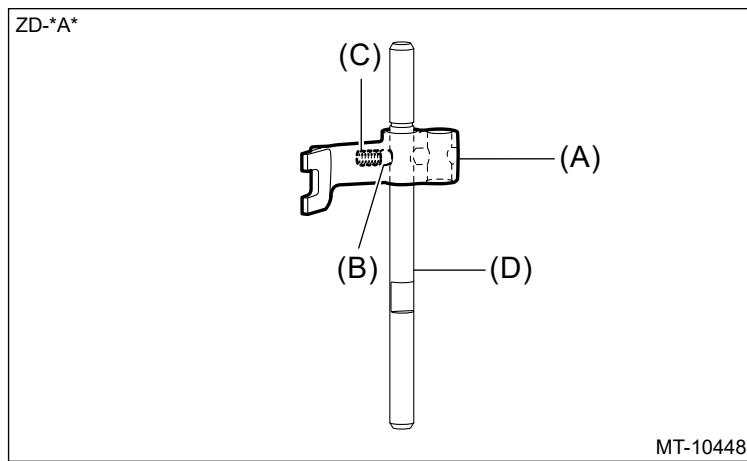
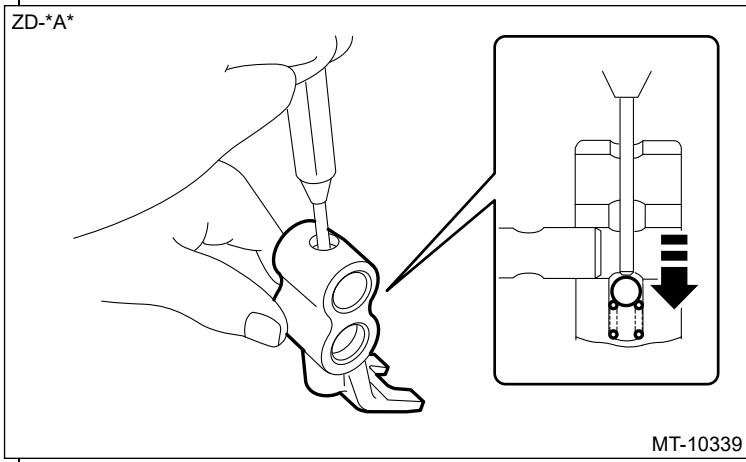
- Set the compression spring (C) and balls (B) to the gear shift head No. 5 (A), and then install the components as a unit to the gear shift fork rod No. 4 (D).

Caution:

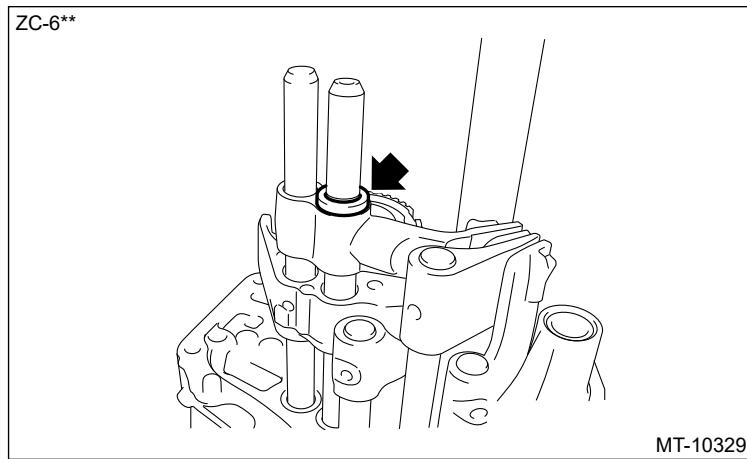
Make sure the balls and compression spring do not pop out.

Note:

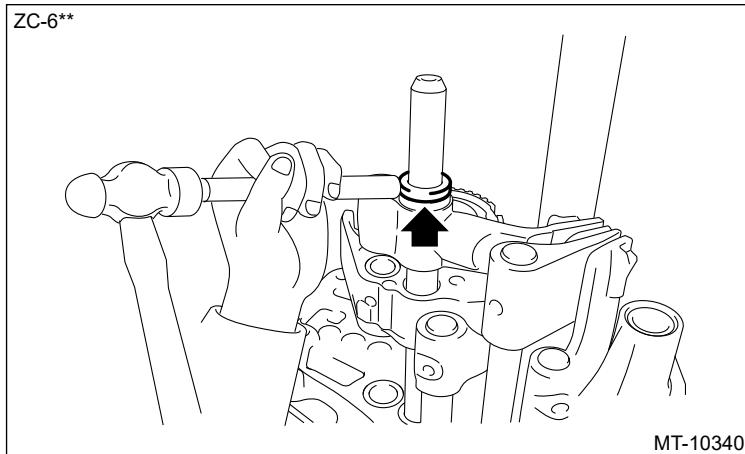
Press in the ball to install.



- Install the washer.



- Install a new snap ring.



3. SHIFT SHAFT

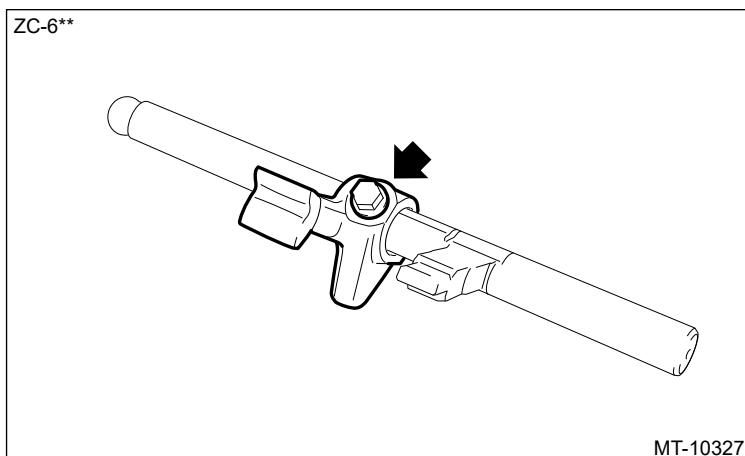
1. Install the shift inner lever FR.

Caution:

Always use a new bolt.

Tightening torque:

33.3 N·m (3.4 kgf-m, 24.6 ft-lb)



MANUAL TRANSMISSION > Transmission Case

INSPECTION

Check the following parts and replace them if you find any of the issues described below.

1. SHIFT SHAFT

1. Check the shift shaft for abnormal wear.
2. Check that the shift shaft does not have deformation, cracks, and any other damage.

2. SHIFT BLOCK

1. Check the shift block for abnormal wear.
2. Check that the shift block does not have deformation, cracks, and any other damage.

3. GEAR SHIFT HEAD

- 1.** Check the gear shift head for abnormal wear.
- 2.** Check that the gear shift head does not have deformation, cracks, and any other damage.

4. GEAR SHIFT FORK ROD

- 1.** Check the gear shift fork rod for abnormal wear.
- 2.** Check that the gear shift fork rod does not have deformation, cracks, and any other damage.

5. HUB SLEEVE

- 1.** Check the hub sleeve for abnormal wear.
- 2.** Check that the hub sleeve does not have deformation, cracks, and any other damage.

6. CLUTCH HUB

- 1.** Check the clutch hub for abnormal wear.
- 2.** Check that the clutch hub does not have deformation, cracks, and any other damage.

7. 6TH GEAR

- 1.** Check the 6th gear for abnormal wear.
- 2.** Check that the 6th gear does not have deformation, cracks, and any other damage.

8. THRUST NEEDLE ROLLER BEARING

- 1.** Check the thrust needle roller bearing for abnormal wear.
- 2.** Check that the thrust needle roller bearing does not have deformation, cracks, and any other damage.

9. 6TH GEAR BEARING INNER RACE

- 1.** Check the 6th gear bearing inner race for abnormal wear.
- 2.** Check that the 6th gear bearing inner race does not have deformation, cracks, and any other damage.

10. OTHER

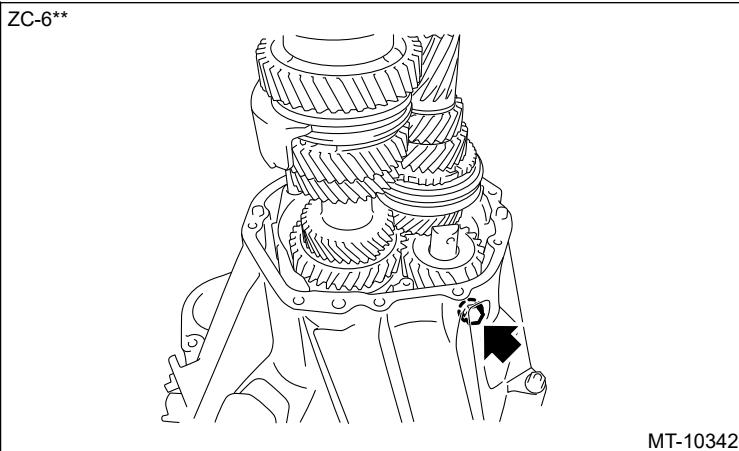
- 1.** Check each part for excessive wear.
- 2.** Check that there is no deformation, cracks or other damages.
- 3.** Check the bearing for smooth rotation.
- 4.** Check the bearing for looseness.

MANUAL TRANSMISSION > Clutch Housing

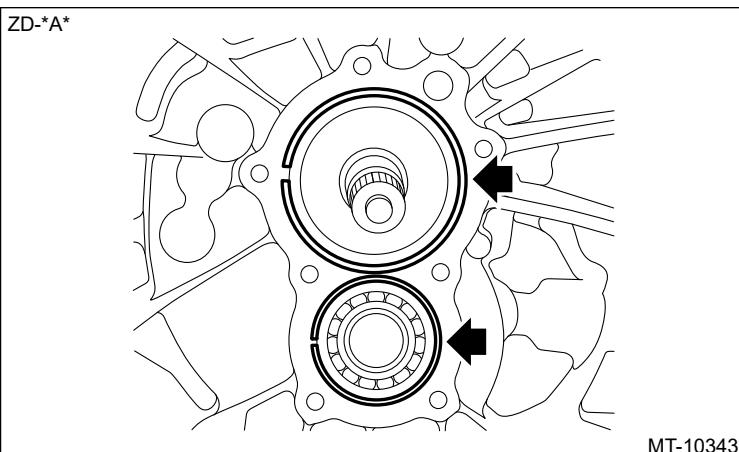
REMOVAL



1. Remove the transmission case. [Ref. to MANUAL TRANSMISSION>Transmission Case>REMOVAL.](#)
2. Remove the harness bracket. [Ref. to MANUAL TRANSMISSION>Switches and Harness>REMOVAL > HARNESS BRACKET.](#)
3. Remove the bolt and gasket securing the reverse idler gear shaft of the clutch housing.



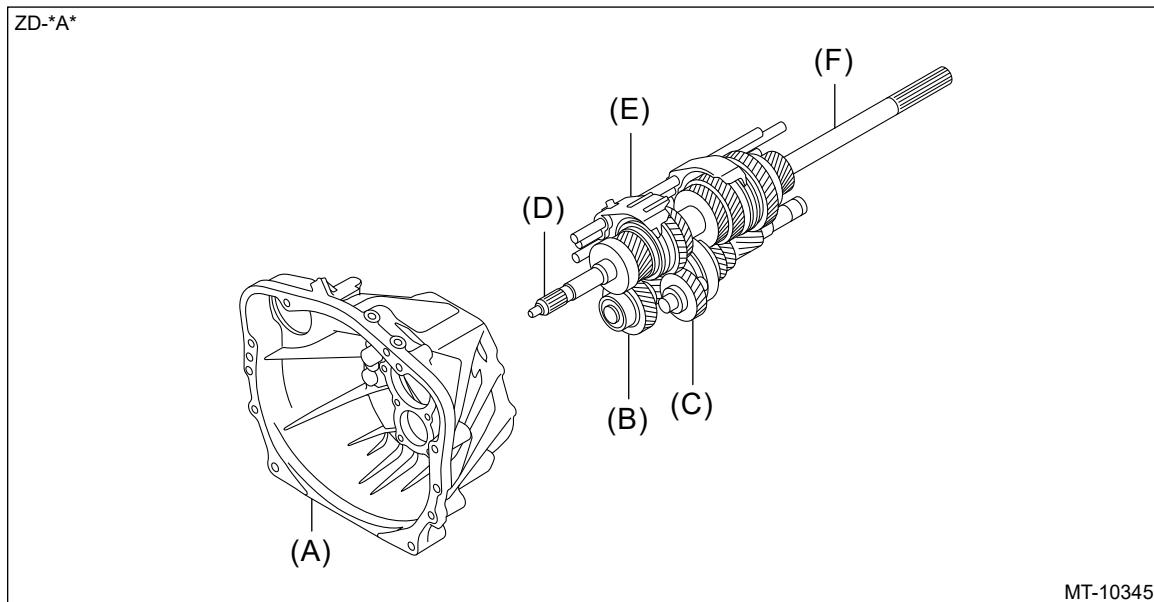
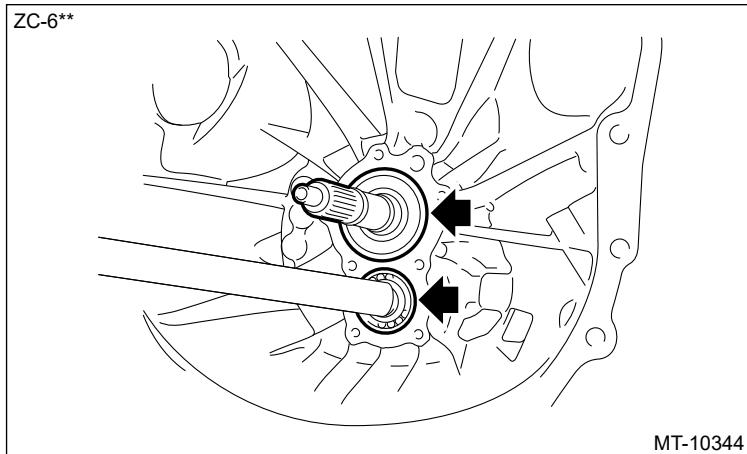
4. Remove the front bearing retainer. [Ref. to MANUAL TRANSMISSION>Front Bearing Retainer>REMOVAL.](#)
5. Remove the snap ring.



6. Use a hammer and a brass bar to remove the counter gear, reverse idler gear, input shaft, shifter fork, and output shaft as a unit.

Caution:

Be careful not to damage the input shaft and counter gear.



(A) Clutch housing
(B) Counter gear

(C) Reverse idler gear
(D) Input shaft

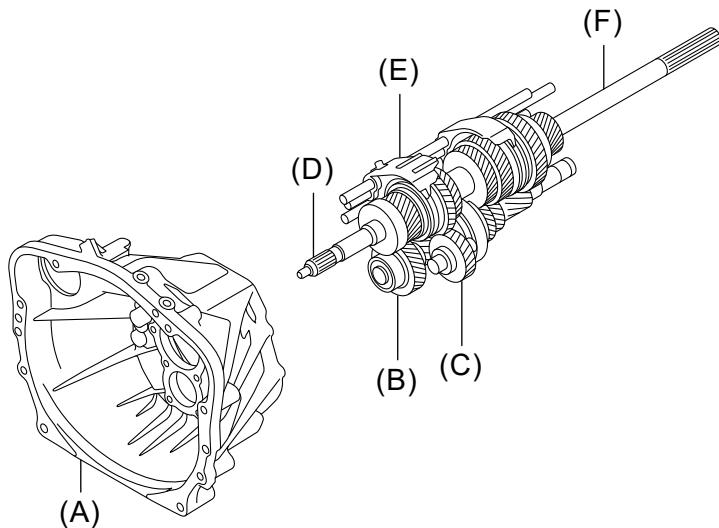
(E) Shifter fork
(F) Output shaft

MANUAL TRANSMISSION > Clutch Housing

INSTALLATION

1. Install the counter gear, reverse idler gear, input shaft, shifter fork, and output shaft as a unit.

ZD-*A*



MT-10345

(A) Clutch housing

(C) Reverse idler gear

(E) Shifter fork

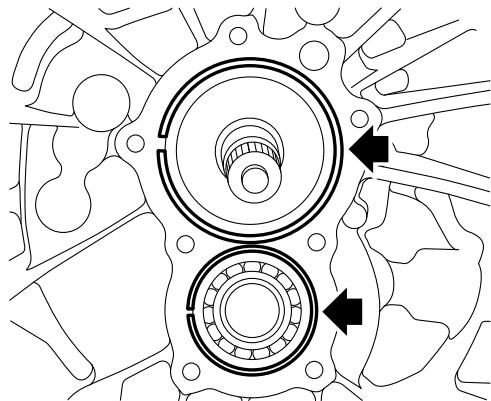
(B) Counter gear

(D) Input shaft

(F) Output shaft

2. Install the snap ring.

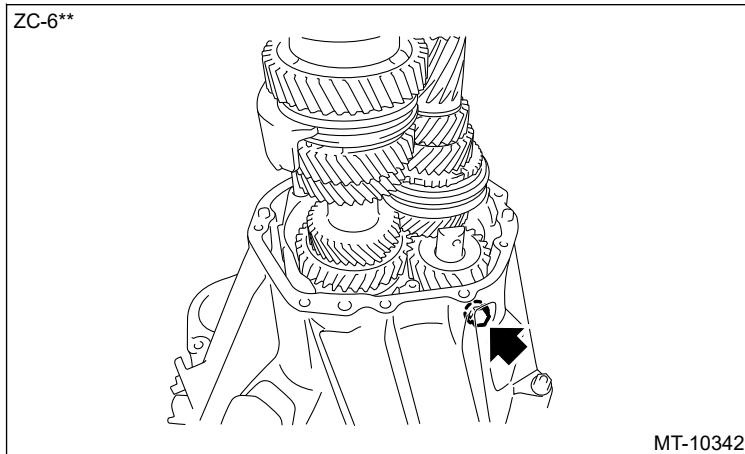
ZD-*A*



MT-10343

3. Install the front bearing retainer.  [Ref. to MANUAL TRANSMISSION>Front Bearing Retainer>INSTALLATION.](#)
4. Using a new gasket, temporarily install the reverse idler gear shaft of the clutch housing.

Caution:**Always use a new bolt.**



5. Attach the harness bracket. [Ref. to MANUAL TRANSMISSION>Switches and Harness>INSTALLATION > HARNESS BRACKET.](#)
6. Install the transmission case. [Ref. to MANUAL TRANSMISSION>Transmission Case>INSTALLATION.](#)

MANUAL TRANSMISSION > Clutch Housing

INSPECTION

Check that there is no deformation, cracks or other damages.

MANUAL TRANSMISSION > Reverse Idler Gear

REMOVAL

For the removal procedures of the reverse idler gear, refer to "Clutch Housing".  [Ref. to MANUAL TRANSMISSION>Clutch Housing>REMOVAL.](#)

MANUAL TRANSMISSION > Reverse Idler Gear

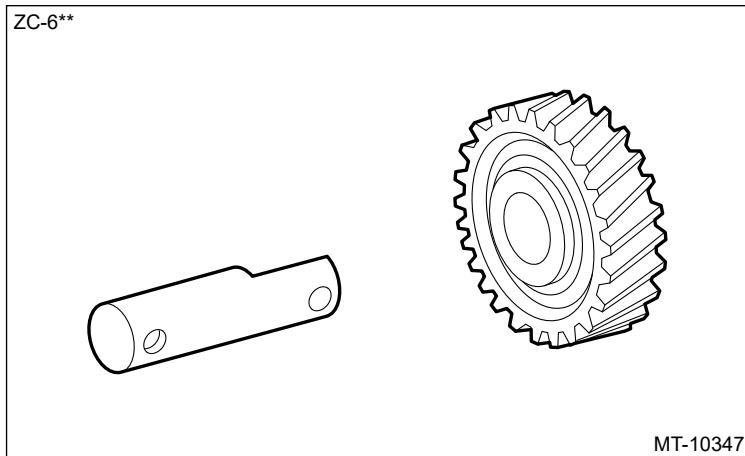
INSTALLATION

For the installation procedures of the reverse idler gear, refer to "Clutch Housing".  [Ref. to MANUAL TRANSMISSION>Clutch Housing>INSTALLATION.](#)

MANUAL TRANSMISSION > Reverse Idler Gear

DISASSEMBLY

1. Remove the reverse idler gear shaft.



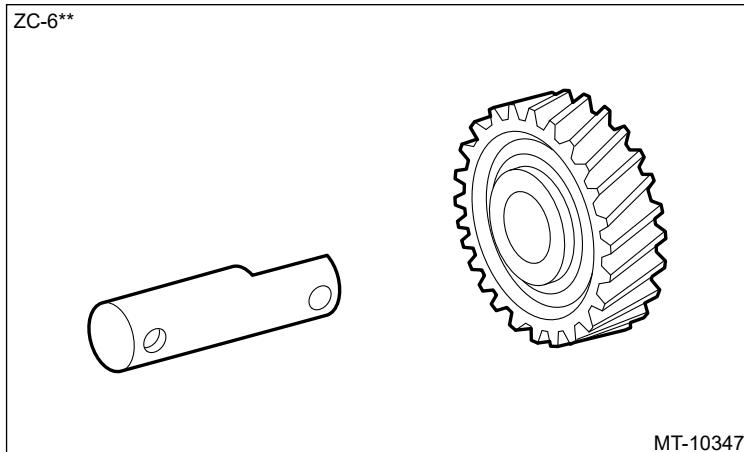
MANUAL TRANSMISSION > Reverse Idler Gear

ASSEMBLY

1. Install the reverse idler gear shaft.

Note:

Apply transmission gear oil to the reverse idler gear shaft.



MANUAL TRANSMISSION > Reverse Idler Gear

INSPECTION

Check the following parts and replace them if you find any of the issues described below.

1. REVERSE IDLER GEAR

1. Check the reverse idler gear for abnormal wear.
2. Check that the reverse idler gear does not have deformation, cracks, and any other damage.

2. REVERSE IDLER GEAR SHAFT

1. Check the reverse idler gear shaft for abnormal wear.
2. Check that the reverse idler gear shaft does not have deformation, cracks, and any other damage.

MANUAL TRANSMISSION > Shifter Fork and Rod

REMOVAL

For the removal procedures of the shifter fork and rod, refer to "Clutch Housing".  [Ref. to MANUAL TRANSMISSION>Clutch Housing>REMOVAL.](#)

MANUAL TRANSMISSION > Shifter Fork and Rod

INSTALLATION

For the installation procedures of the shifter fork and rod, refer to "Clutch Housing".  [Ref. to MANUAL TRANSMISSION>Clutch Housing>INSTALLATION.](#)

MANUAL TRANSMISSION > Shifter Fork and Rod

DISASSEMBLY

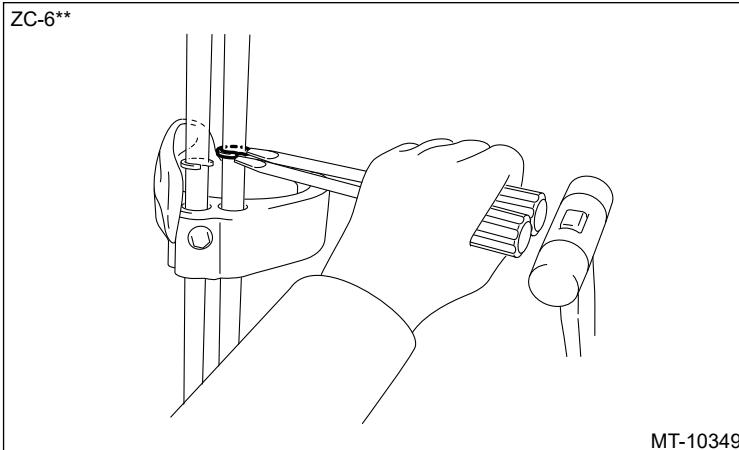


1. GEAR SHIFT FORK ROD NO. 1

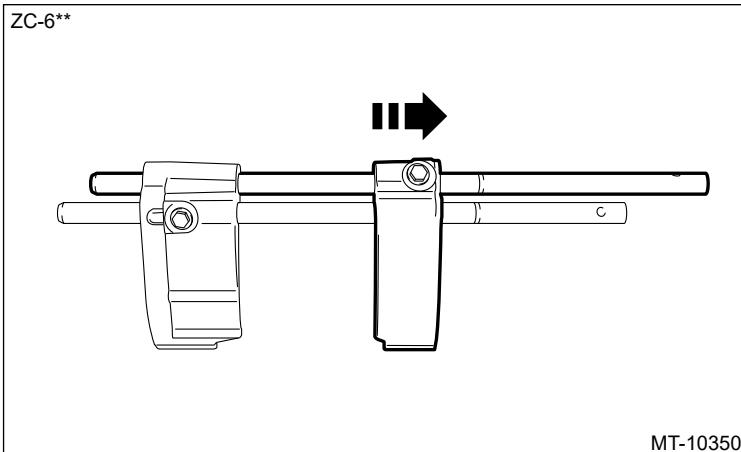
1. Remove the snap ring.

Caution:

Make sure the snap ring does not pop out.



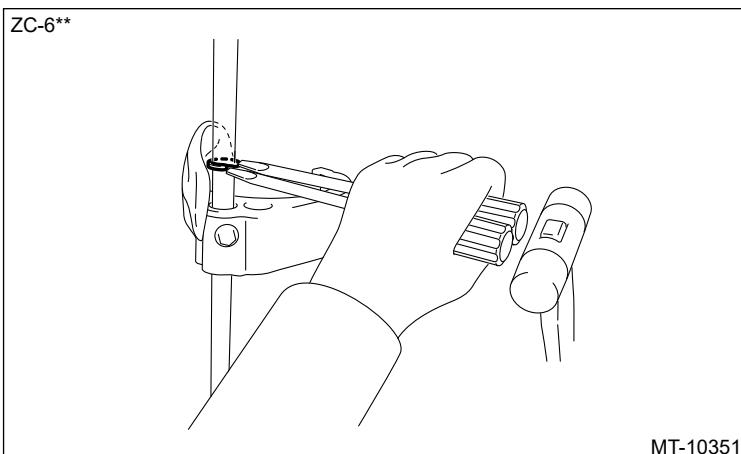
2. Remove the gear shift fork rod No. 1 and gear shift fork No. 1 as a unit.



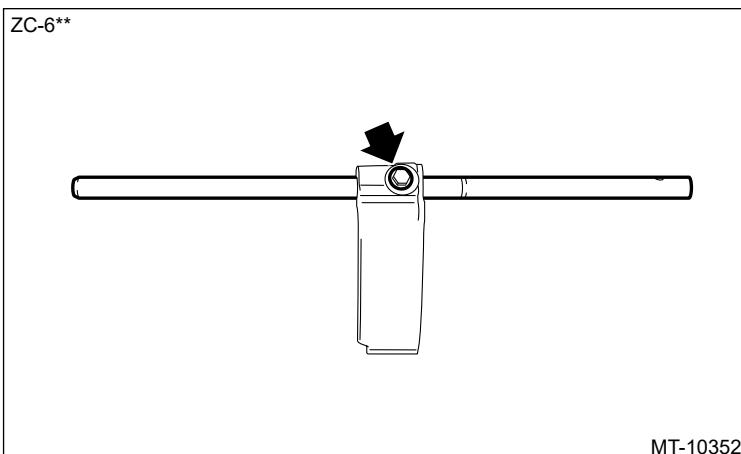
- 3.** Remove the snap ring.

Caution:

Make sure the snap ring does not pop out.



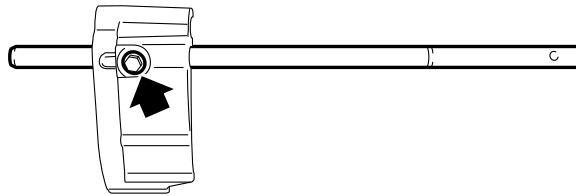
- 4.** Remove the gear shift fork rod No. 1.



2. GEAR SHIFT FORK ROD NO. 2

- 1.** Remove the gear shift fork rod No. 1. [Ref. to MANUAL TRANSMISSION>Shifter Fork and Rod>DISASSEMBLY > GEAR SHIFT FORK ROD NO. 1.](#)
- 2.** Remove the gear shift fork rod No. 2.

ZC-6**



MT-10353

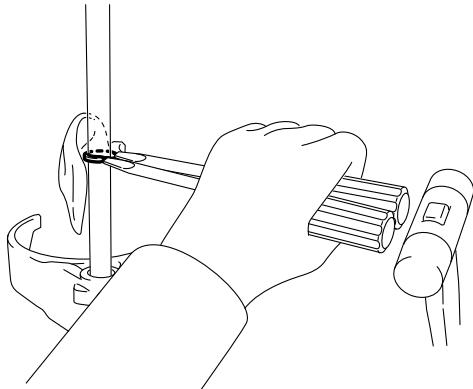
3. GEAR SHIFT FORK ROD NO. 3

1. Remove the snap ring.

Caution:

Make sure the snap ring does not pop out.

ZC-6**



MT-10354

2. Remove the gear shift fork rod No. 3.

ZD-*A*



MT-10355

MANUAL TRANSMISSION > Shifter Fork and Rod

ASSEMBLY

1. GEAR SHIFT FORK ROD NO. 1

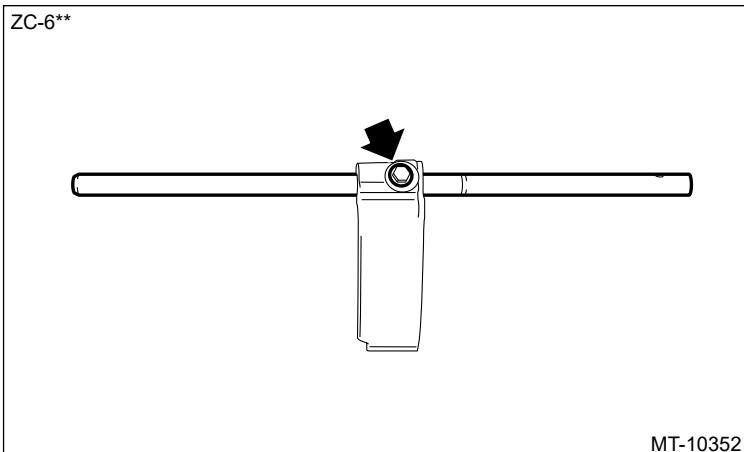
1. Install the gear shift fork No. 1.

Caution:

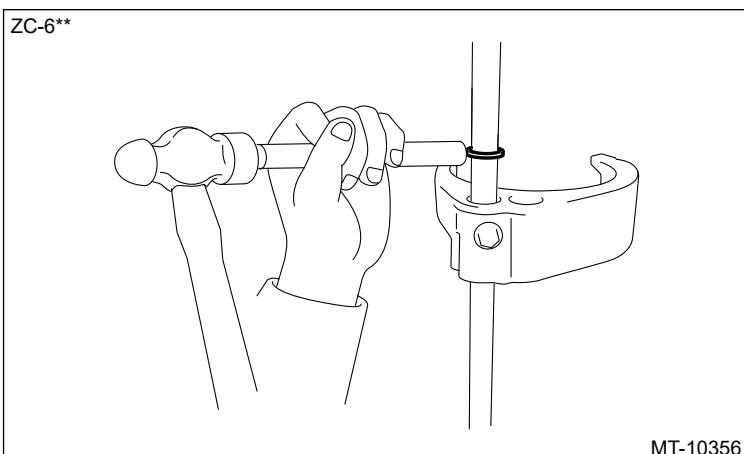
Always use a new bolt.

Tightening torque:

19.5 N·m (2.0 kgf-m, 14.4 ft-lb)



2. Install a new snap ring.



2. GEAR SHIFT FORK ROD NO. 2

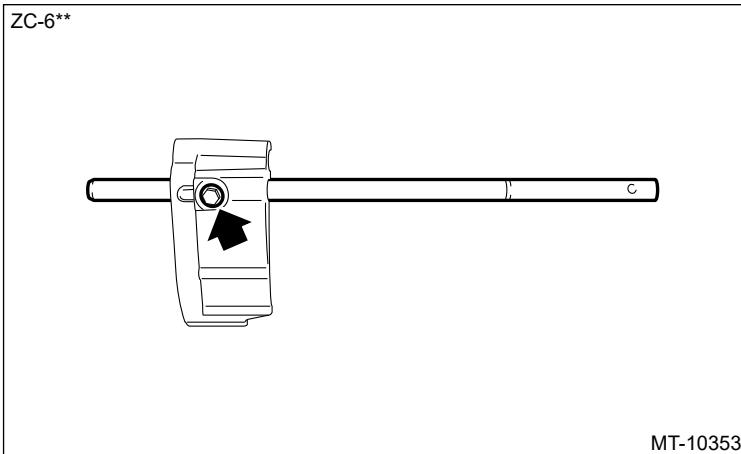
1. Install the gear shift fork No. 2.

Caution:

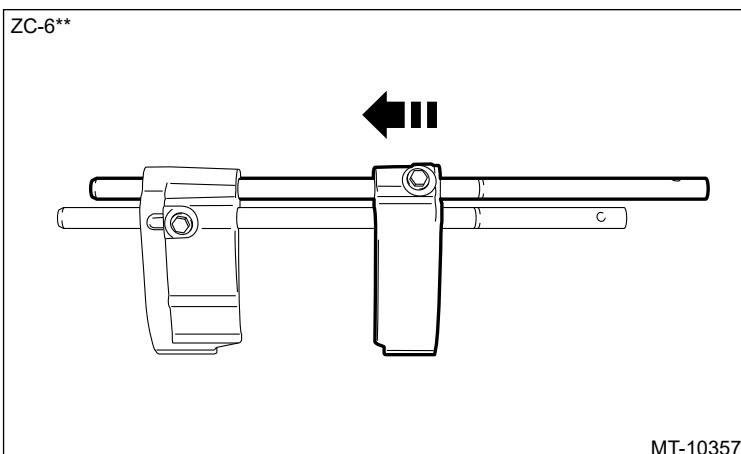
Always use a new bolt.

Tightening torque:

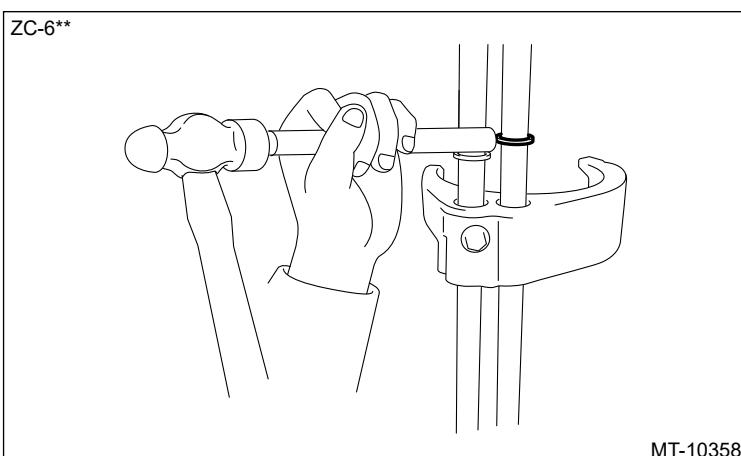
19.5 N·m (2.0 kgf-m, 14.4 ft-lb)



- 2.** Install the gear shift fork rod No. 1 and gear shift fork No. 1 as a unit to the gear shift fork rod No. 2.



- 3.** Install a new snap ring.



3. GEAR SHIFT FORK ROD NO. 3

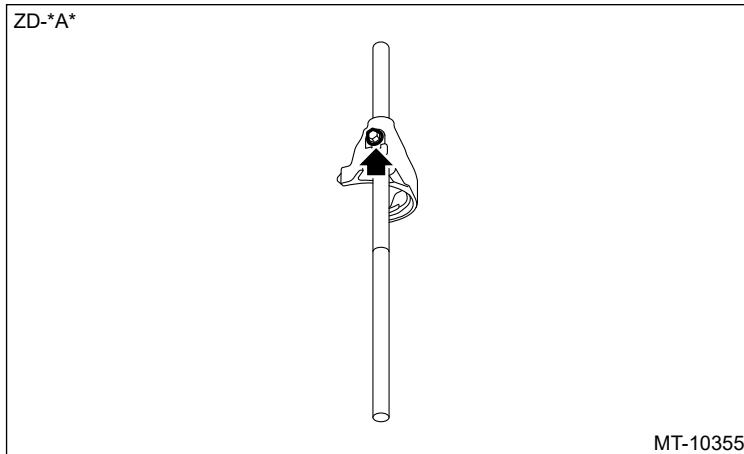
- 1.** Install the gear shift fork No. 3.

Caution:

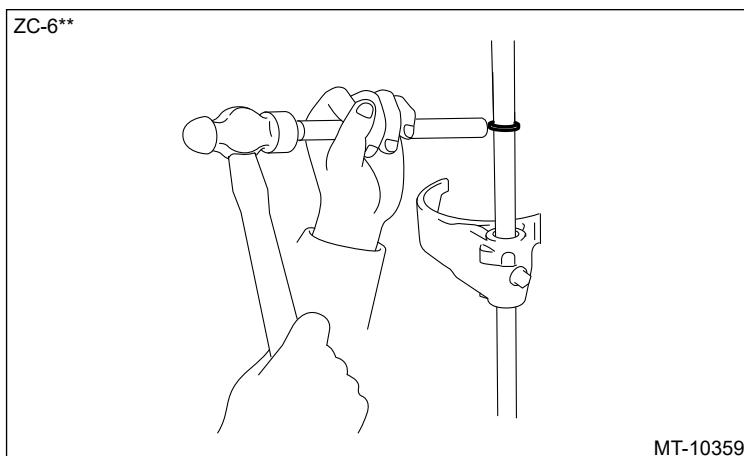
Always use a new bolt.

Tightening torque:

19.5 N·m (2.0 kgf-m, 14.4 ft-lb)



- 2.** Install a new snap ring.



MANUAL TRANSMISSION > Shifter Fork and Rod

INSPECTION

Check the following parts and replace them if you find any of the issues described below.

1. GEAR SHIFT FORK

- 1.** Check the gear shift fork for abnormal wear.
- 2.** Check that the gear shift fork does not have deformation, cracks, and any other damage.

2. GEAR SHIFT FORK ROD

- 1.** Check the gear shift fork rod for abnormal wear.
- 2.** Check that the gear shift fork rod does not have deformation, cracks, and any other damage.

MANUAL TRANSMISSION > Counter Gear

REMOVAL

For the removal procedures of the counter gear, refer to "Clutch Housing".  [Ref. to MANUAL TRANSMISSION>Clutch Housing>REMOVAL.](#)

MANUAL TRANSMISSION > Counter Gear

INSTALLATION

For the installation procedures of the counter gear, refer to "Clutch Housing".  [Ref. to MANUAL TRANSMISSION>Clutch Housing>INSTALLATION.](#)

MANUAL TRANSMISSION > Counter Gear

DISASSEMBLY

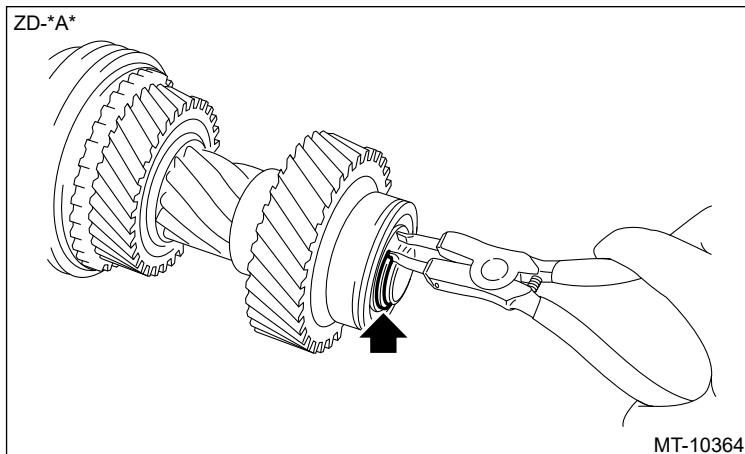


1. Remove the front bearing.

Caution:

Check the direction of the parts before removing them.

- (1) Remove the snap ring.

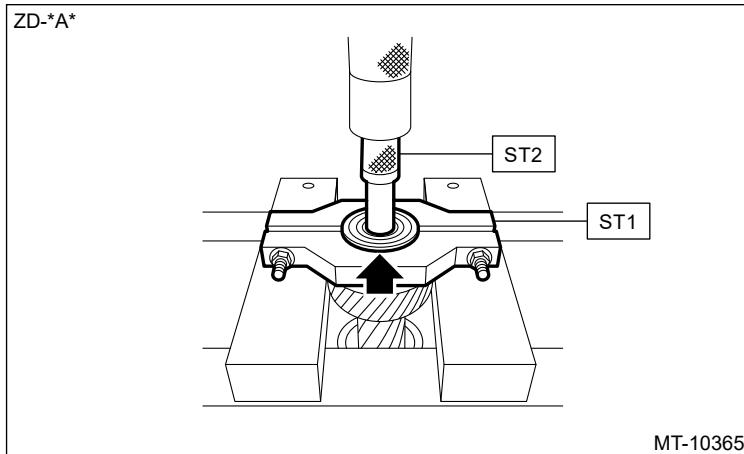


- (2) Remove the front bearing using the ST1, ST2 and a press.

Preparation tool:

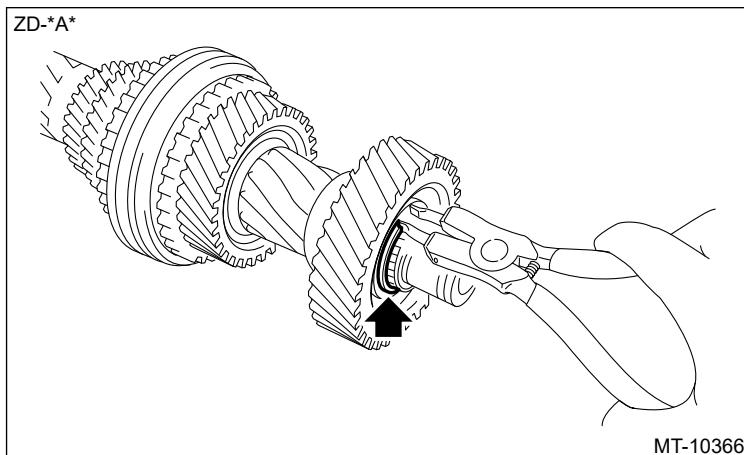
ST1: REMOVER (498077400)

ST2: REMOVER (899864100)



2. Remove the drive gear.

- (1) Remove the snap ring.

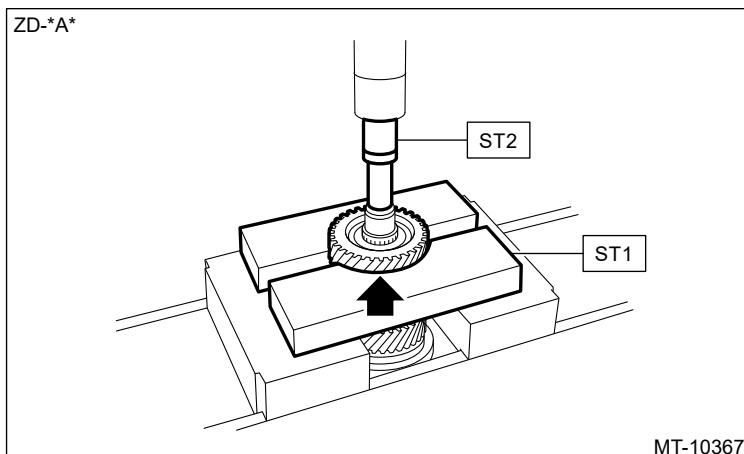


- (2) Remove the drive gear using the ST1, ST2 and a press.

Preparation tool:

ST1: REMOVER (899714110)

ST2: REMOVER (899864100)

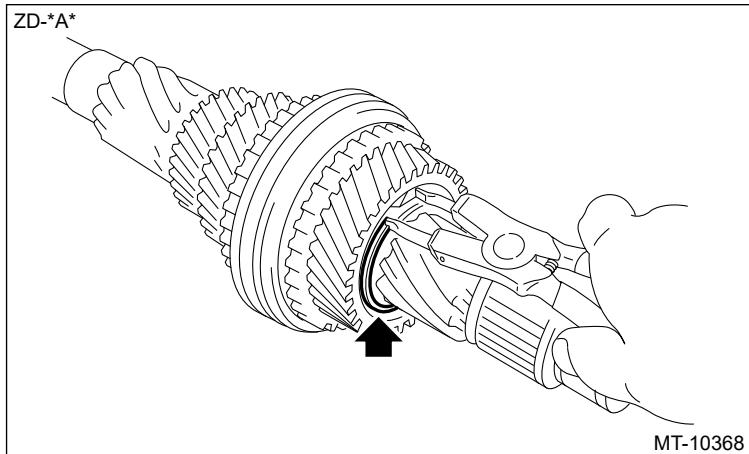


3. Remove the 4th gear.

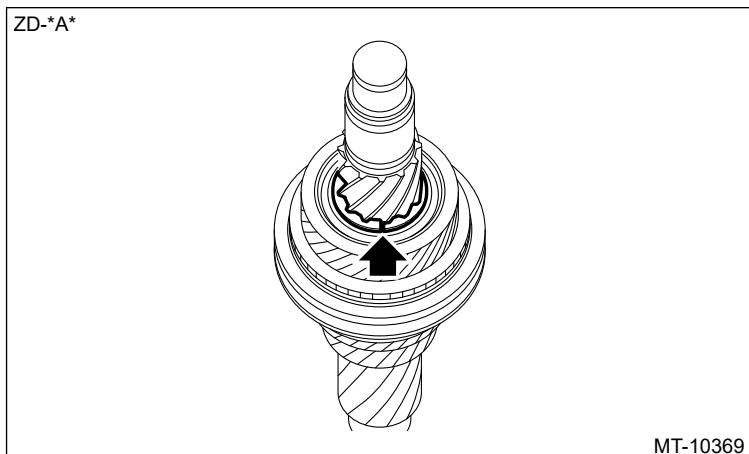
Caution:

Check the direction of the parts before removing them.

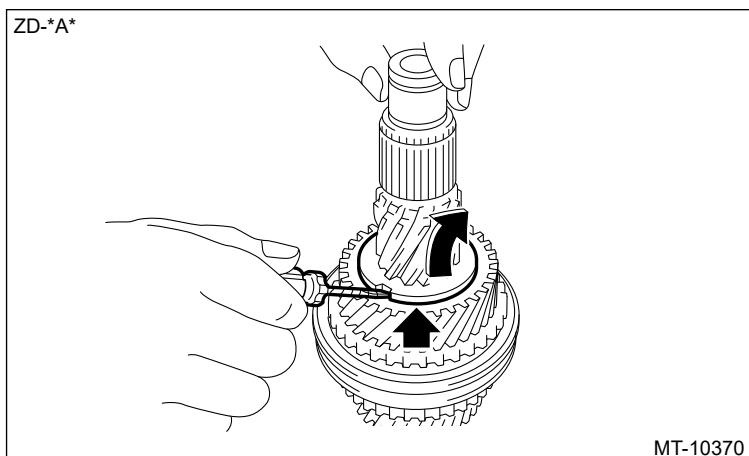
- (1) Remove the snap ring.



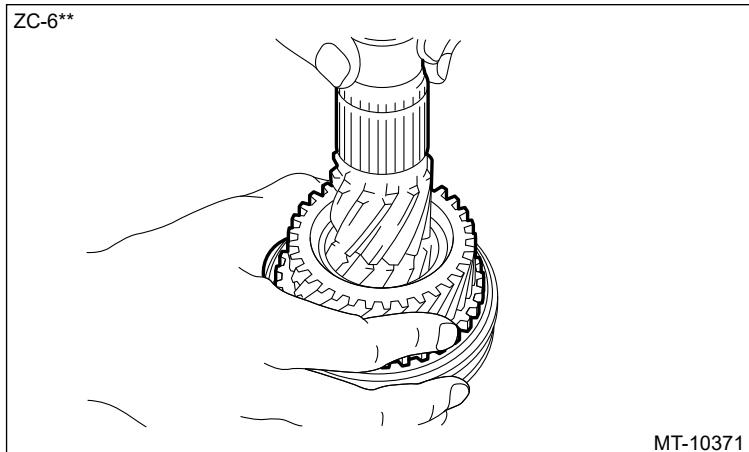
(2) Remove the 4th retaining ring washer and 4th inner race thrust washer.



(3) Remove the 4th gear bearing inner race using a flat tip screwdriver wrapped with protection tape.



(4) Remove the 4th gear and synchronizer ring No. 1.

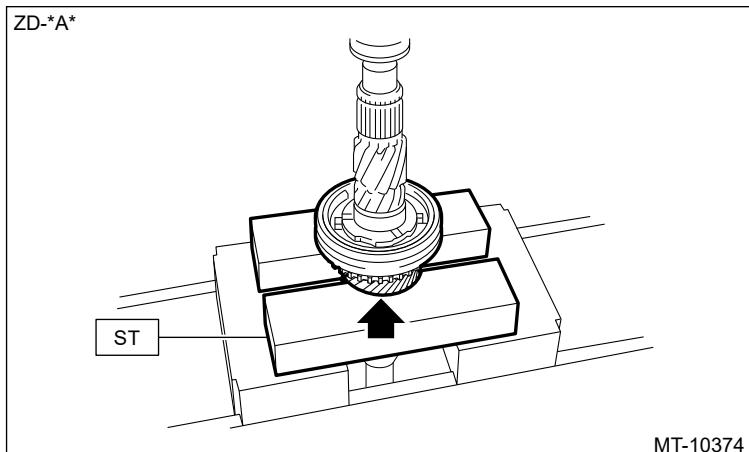


MT-10371

4. Use the ST and a press to remove the clutch hub No. 2, 3rd gear, synchronizer ring set No. 3, and 3rd gear needle roller bearing as a unit.

Preparation tool:

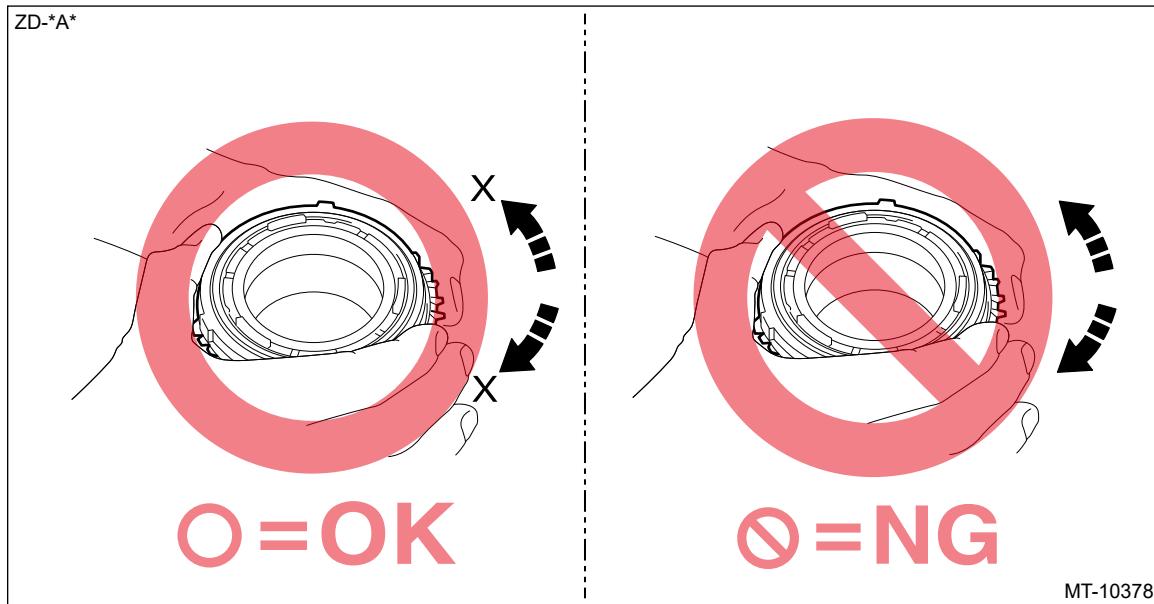
ST1: 899714110 (REMOVER)



MT-10374

5. Remove the synchronizer ring set No. 3.

- (1) Apply transmission gear oil to the tapered cone portion of the 3rd gear and to the synchronizer ring set No. 3.
- (2) Press the synchronizer ring set No. 3 against the 3rd gear with your hand and perform the following checks.
 - 1) Confirm that the parts do not turn in the rotational directions.



2) If they do, replace the synchronizer ring set No. 3 with a new one.

(3) Remove the synchronizer ring set No. 3 from the 3rd gear.

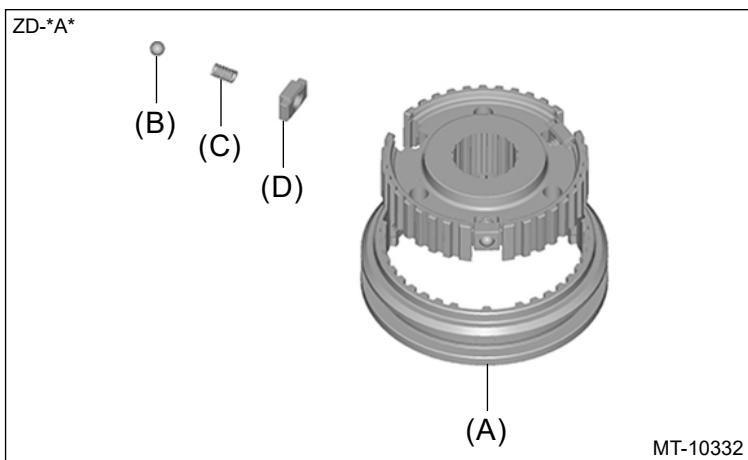
- 6.** Remove the hub sleeve No. 2 (A), and then remove the ball (B), synchromesh shifting key spring No. 1 (C), and synchromesh shifting key No. 1 (D).

Caution:

- Use a cloth to keep the synchromesh shifting key No. 1, synchromesh shifting key spring No. 1, and ball from popping out.
- Be careful not to deform the synchromesh shifting key spring No. 1.
- Check the direction of the parts before removing them.

Note:

Make sure not to change the assembly positions for the hub sleeve No. 2 and synchromesh shifting key No. 1.



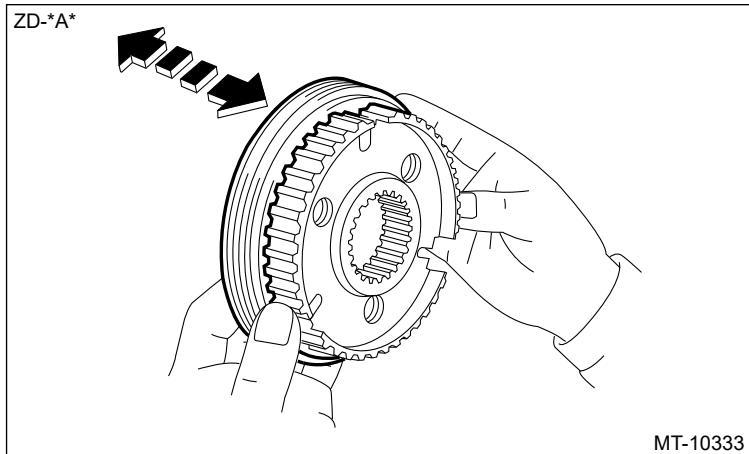
- 7.** Check the hub sleeve No. 2.

(1) Check the end of the spline gear of the hub sleeve No. 2.

If it is worn, replace the hub sleeve No. 2 with a new one.

(2) Install the hub sleeve No. 2 to the clutch hub No. 2, and check that the parts slide smoothly.

If they do not slide smoothly, replace the hub sleeve No. 2 and the clutch hub No. 2 with new ones.



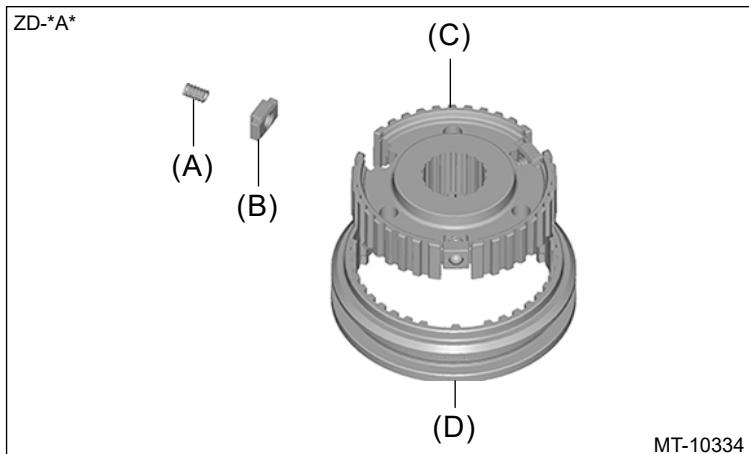
MANUAL TRANSMISSION > Counter Gear

ASSEMBLY

- Set the synchromesh shifting key spring No. 1 (A) and synchromesh shifting key No. 1 (B) to the clutch hub No. 2 (C), and install the hub sleeve No. 2 (D).

Note:

Make sure not to change the assembly positions for the hub sleeve No. 2 and synchromesh shifting key No. 1.



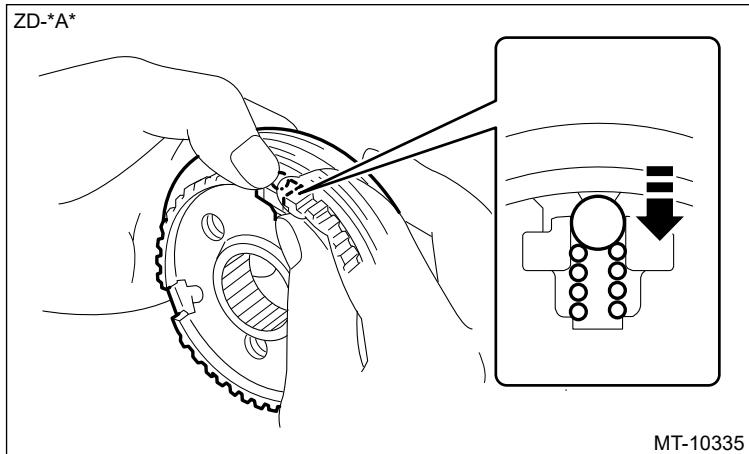
- Install the ball while pressing the synchromesh shifting key spring No. 1.

Caution:

Use vaseline and make sure the ball does not pop out.

Note:

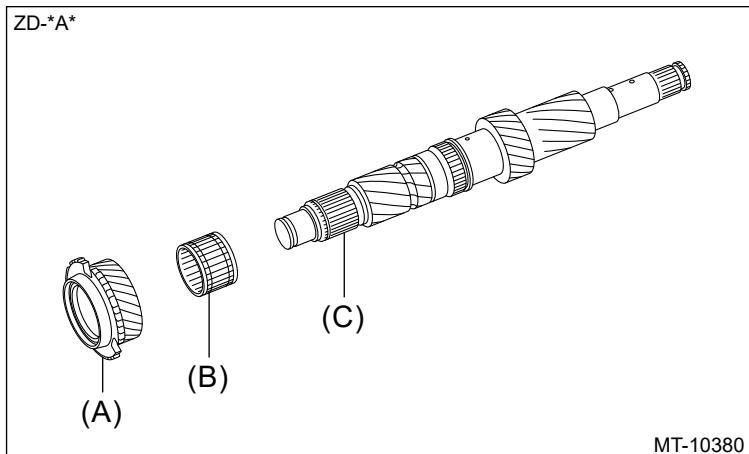
- Apply transmission gear oil to the sliding area of the clutch hub No. 2.
- Secure the synchromesh shifting key spring No. 1.



3. Install the 3rd gear needle roller bearing and 3rd gear.

Note:

Apply transmission gear oil to the 3rd gear needle roller bearing and 3rd gear.



(A) 3rd gear

(B) 3rd gear needle roller bearing

(C) Counter shaft

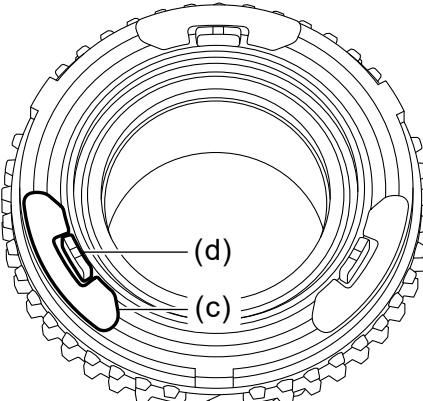
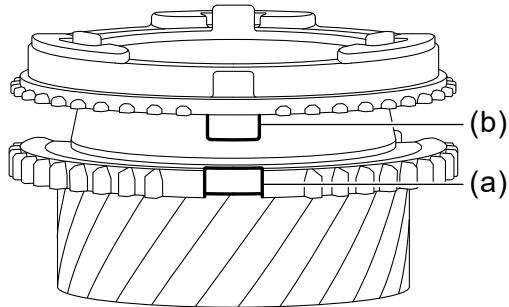
4. Install the clutch hub No. 2.

- (1) Install the synchronizer ring set No. 3 to the 3rd gear.

Note:

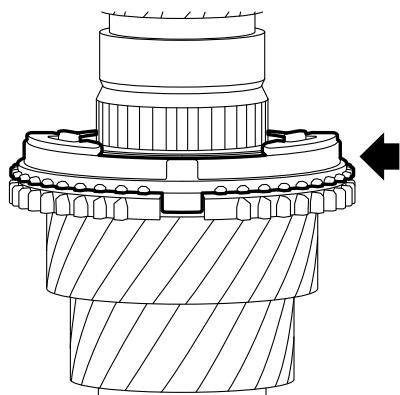
- Align the centering claw (b) with the gear groove (a).
- Align the inner ring claw (d) with the outer ring groove (c).

ZD-*A*



MT-10381

ZD-*A*



MT-10382

(2) Install the clutch hub No. 2 using the ST1, ST2 and a press.

Preparation tool:

ST1: DRIFT 2 (398477703)

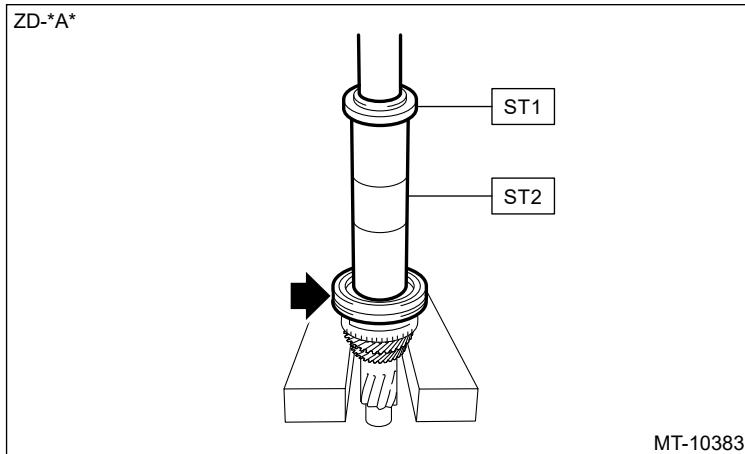
ST2: INSTALLER (18654AA000)

Caution:

After the installation, check that the synchronizer ring set No. 3 slides properly.

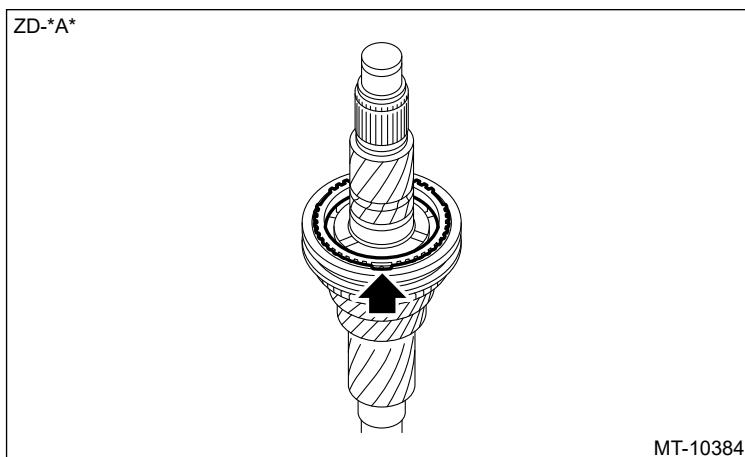
Note:

Press-fit the clutch hub No. 2 until it contacts the counter shaft.



5. Install the 4th gear.

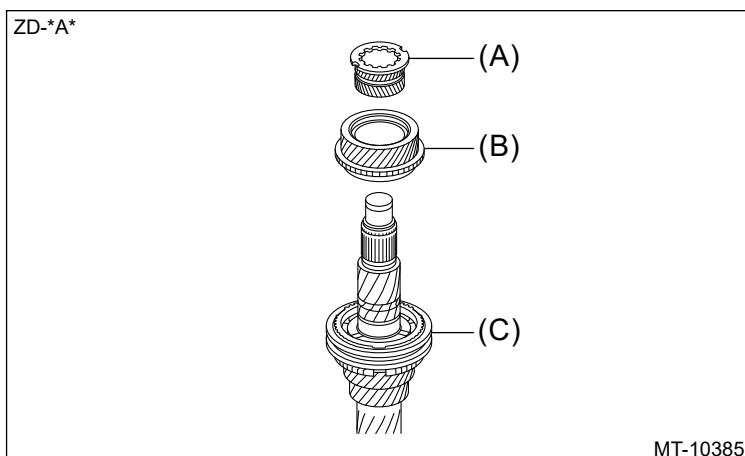
- (1) Install the synchronizer ring No. 1 to the clutch hub No. 2.



- (2) Install the 4th gear and 4th gear bearing inner race.

Note:

Apply transmission gear oil to the 4th gear and 4th gear bearing inner race.



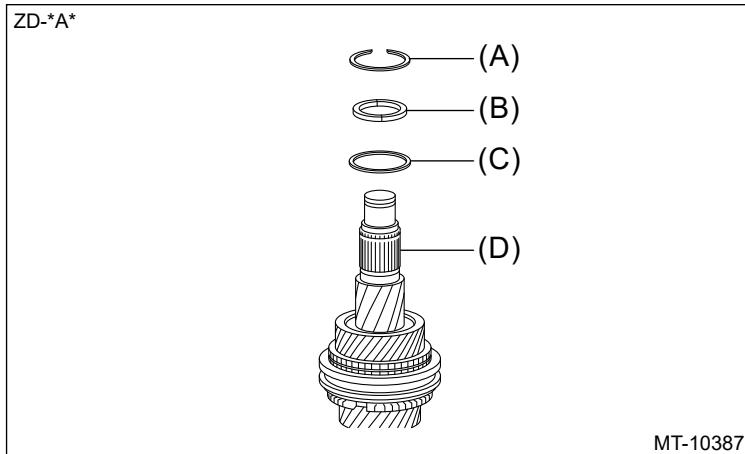
(A) 4th gear bearing inner race

(B) 4th gear

(C) Clutch hub No. 2

6. Select a 4th inner race thrust washer.

- (1) Install the 4th inner race thrust washer, 4th retaining ring washer, and snap ring that you removed in step 4 of the counter gear disassembly procedure.



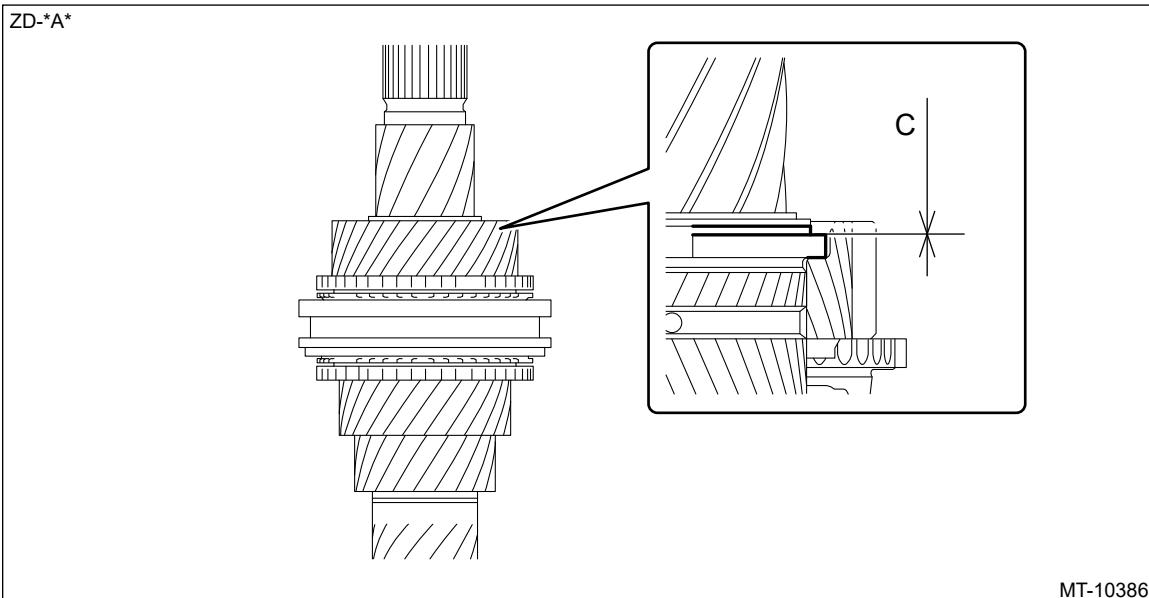
- (2) Remove the 4th inner race thrust washer, 4th retaining ring washer, and snap ring.
- (3) Select a suitable 4th inner race thrust washer so that the thrust clearance and the clearance "C" between the 4th gear bearing inner race and the 4th inner race thrust washer are within the specified value.

Note:

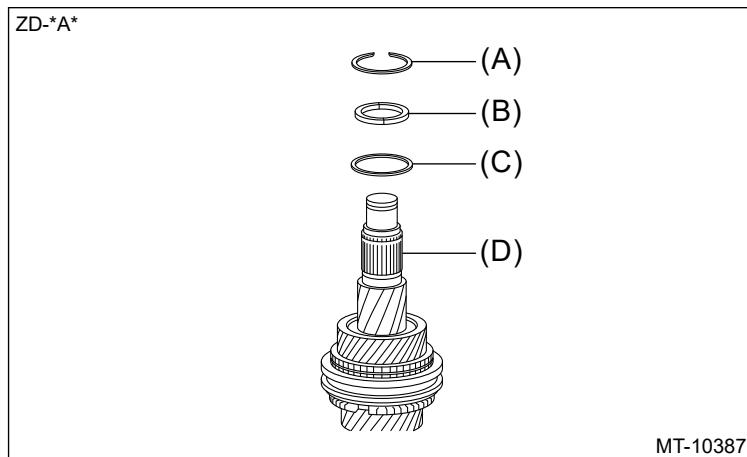
- Select the thickest one that can be installed.
- The 4th inner race thrust washer is a non-reusable part.

Specification:

0 – 0.1 mm (0 – 0.004 in)



- (4) Install the selected 4th inner race thrust washer, a new 4th retaining ring washer, and a new snap ring.

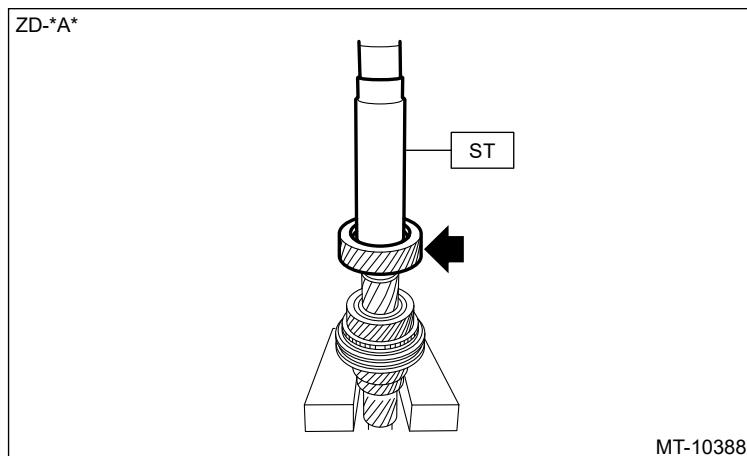


7. Install the drive gear.

(1) Using the ST and a press, install the drive gear.

Preparation tool:

ST: EXTENSION DRIVE SHAFT (927130000)



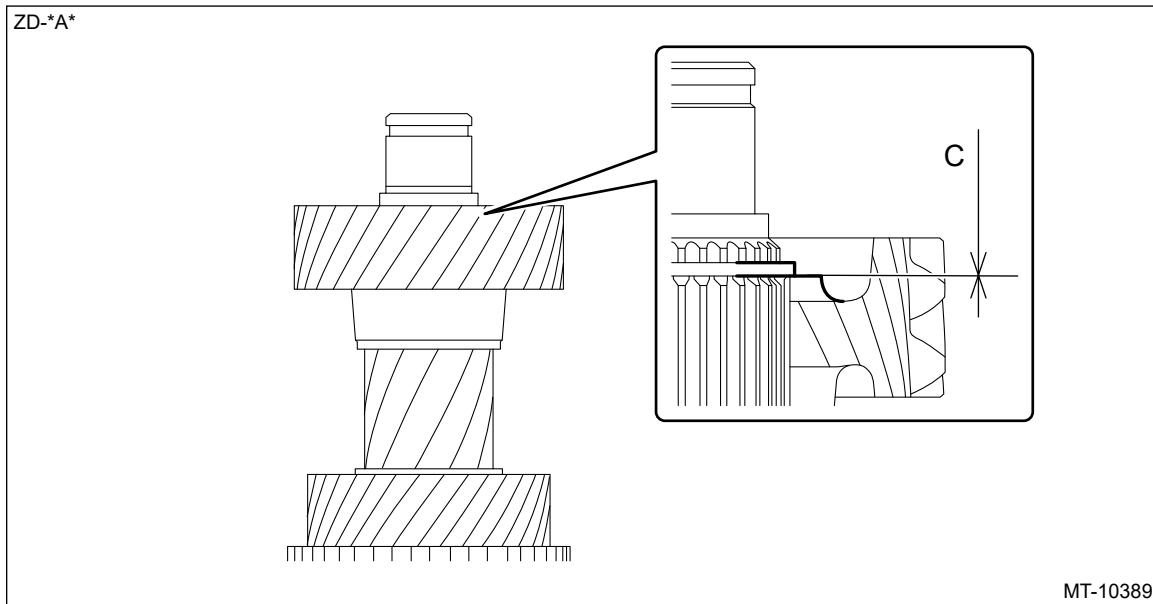
(2) Select a suitable snap ring so that the clearance "C" between the drive gear and snap ring is within the specified value.

Note:

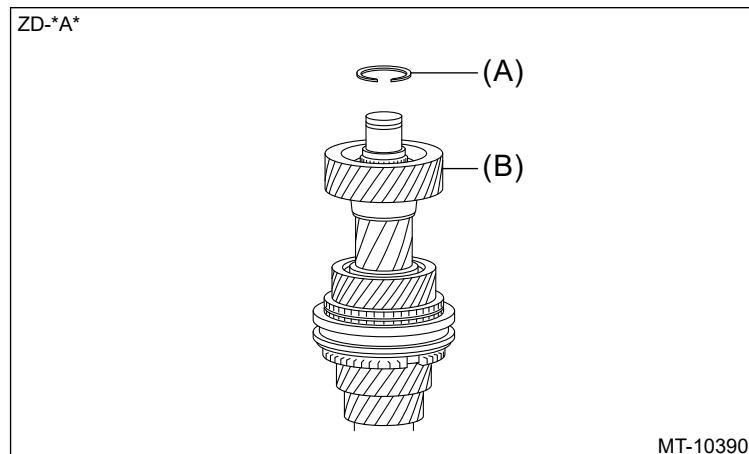
- Select the thickest one that can be installed.
 - The snap ring is a non-reusable part.

Specification:

0 – 0.1 mm (0 – 0.004 in)



(3) Install the selected snap ring.



(A) Snap ring

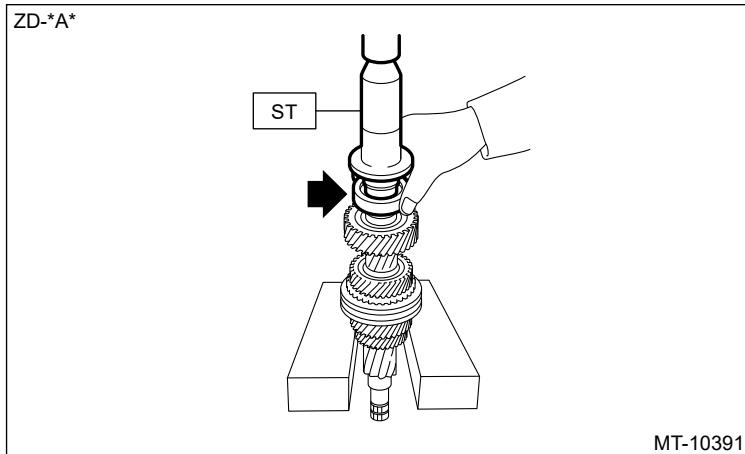
(B) Drive gear

8. Install the front bearing.

(1) Using the ST and a press, install a new front bearing.

Preparation tool:

ST: INSTALLER (498057300)



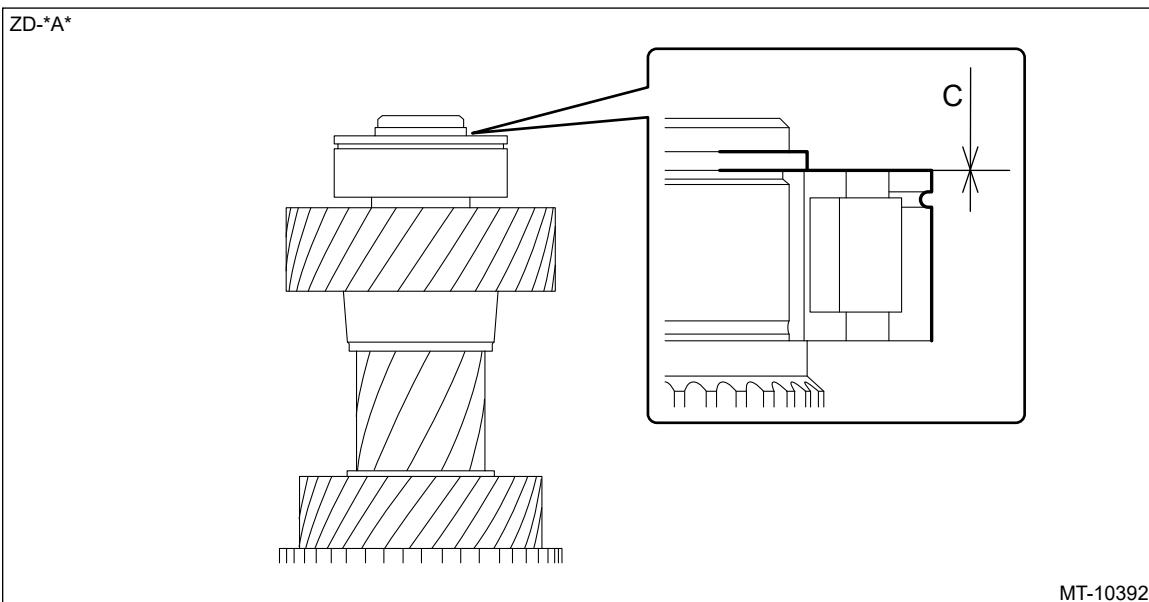
- (2) Select a suitable snap ring so that the clearance "C" between the front bearing and snap ring is within the specified value.

Note:

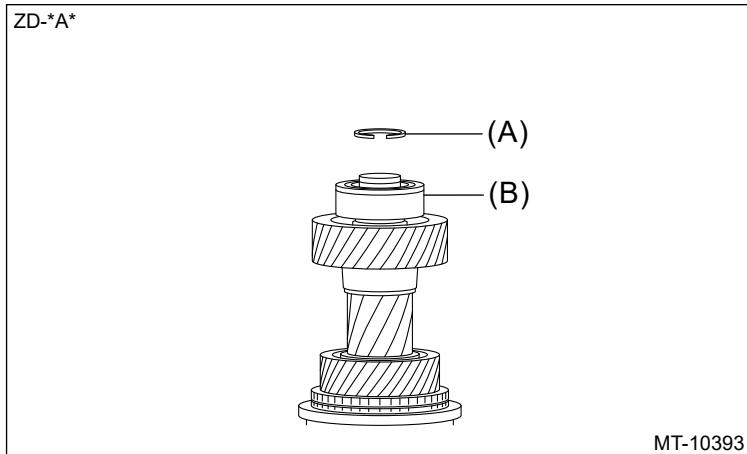
- Select the thickest one that can be installed.
- The snap ring is a non-reusable part.

Specification:

0 – 0.1 mm (0 – 0.004 in)



- (3) Install the selected snap ring.



MANUAL TRANSMISSION > Counter Gear

INSPECTION

Check the following parts and replace them if you find any of the issues described below.

1. DRIVE GEAR

1. Check the drive gear for abnormal wear.
2. Check that the drive gear does not have deformation, cracks, and any other damage.

2. 4TH GEAR BEARING INNER RACE

1. Check the 4th gear bearing inner race for abnormal wear.
2. Check that the 4th gear bearing inner race does not have deformation, cracks, and any other damage.

3. 4TH GEAR

1. Check the 4th gear for abnormal wear.
2. Check that the 4th gear does not have deformation, cracks, and any other damage.

4. 3RD GEAR

1. Check the 3rd gear for abnormal wear.
2. Check that the 3rd gear shift shaft does not have deformation, cracks, and any other damage.

5. SYNCHRONIZER RING

1. Check the synchronizer ring for abnormal wear.
2. Check that the synchronizer ring does not have deformation, cracks, and any other damage.

6. HUB SLEEVE

1. Check the hub sleeve for abnormal wear.
2. Check that the hub sleeve does not have deformation, cracks, and any other damage.

7. CLUTCH HUB

- 1.** Check the clutch hub for abnormal wear.
- 2.** Check that the clutch hub does not have deformation, cracks, and any other damage.

8. COUNTER SHAFT

- 1.** Check the counter shaft for abnormal wear.
- 2.** Check that the counter shaft does not have deformation, cracks, and any other damage.

9. OTHER

- 1.** Check each part for excessive wear.
- 2.** Check that there is no deformation, cracks or other damages.
- 3.** Check the bearing for smooth rotation.
- 4.** Check the bearing for looseness.

MANUAL TRANSMISSION > Main Shaft

REMOVAL

For the removal procedures of the main shaft, refer to "Clutch Housing".  [Ref. to MANUAL TRANSMISSION>Clutch Housing>REMOVAL.](#)

MANUAL TRANSMISSION > Main Shaft

INSTALLATION

For the installation procedures of the main shaft, refer to "Clutch Housing".  [Ref. to MANUAL TRANSMISSION>Clutch Housing>INSTALLATION.](#)

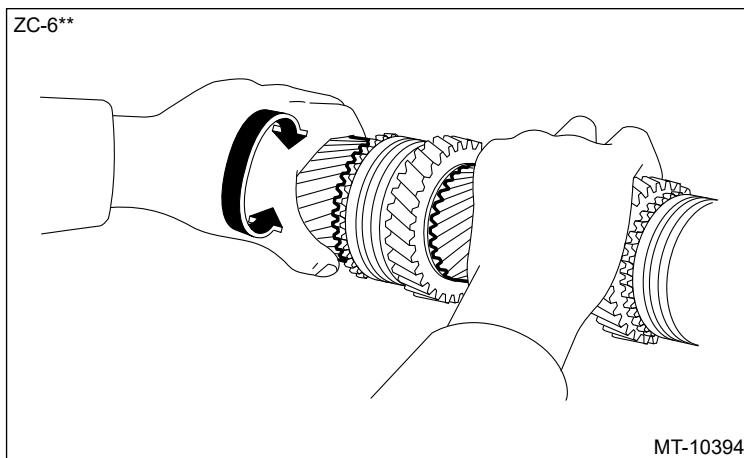
MANUAL TRANSMISSION > Main Shaft

DISASSEMBLY

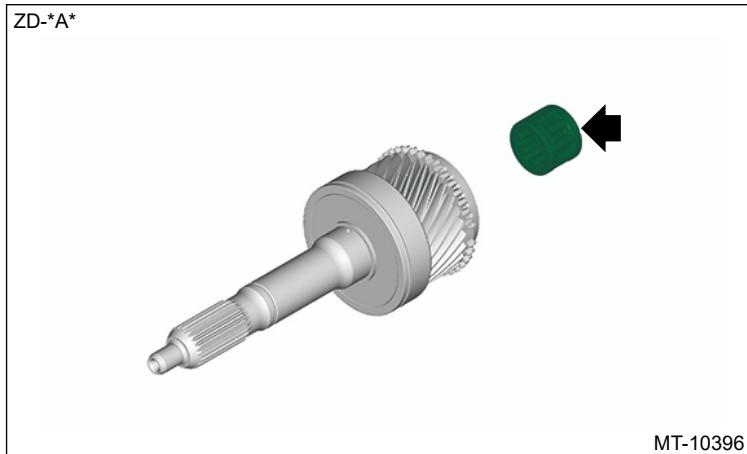


1. INPUT SHAFT

- 1.** Check the needle roller bearing of the input shaft.
 - (1) Connect the input shaft and output shaft, and then secure the output shaft.
 - (2) Check that the input shaft rotates smoothly.



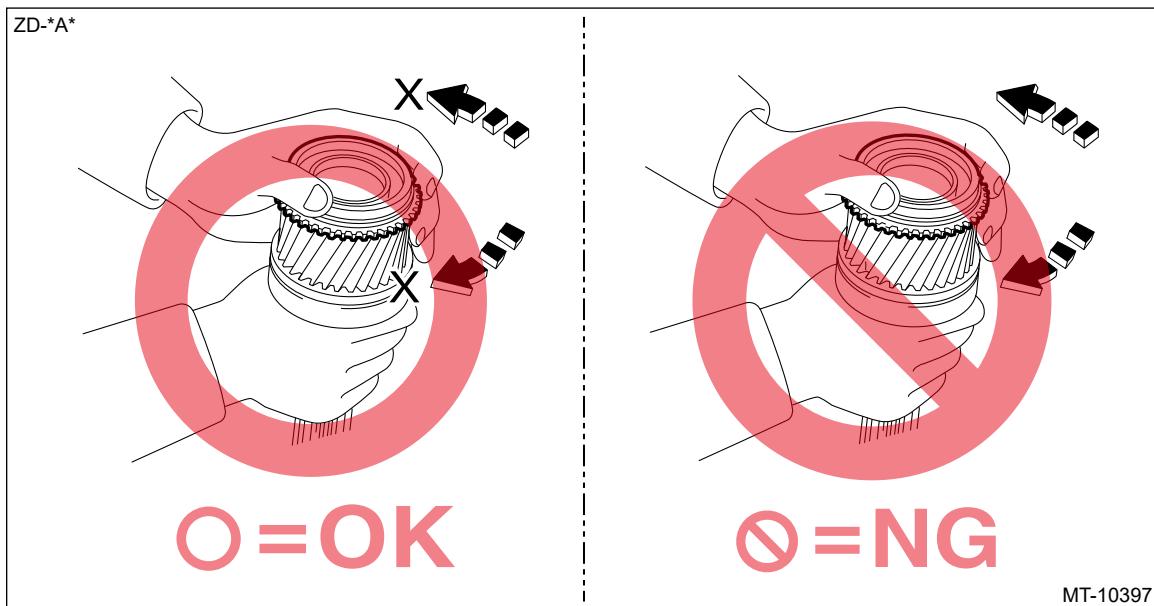
- 2.** Disconnect the input shaft and output shaft.
- 3.** Remove the needle roller bearing.



4. Remove the synchronizer ring No. 2.

- (1) Apply transmission gear oil to the cone portion of the input shaft gear.
- (2) Press the synchronizer ring No. 2 against the input shaft gear with your hand and perform the following checks.

1) Confirm that the parts do not turn in the rotational directions.



- 2) If they do, replace the synchronizer ring No. 2 with a new one.
- (3) Remove the synchronizer ring No. 2.

ZD-*A*

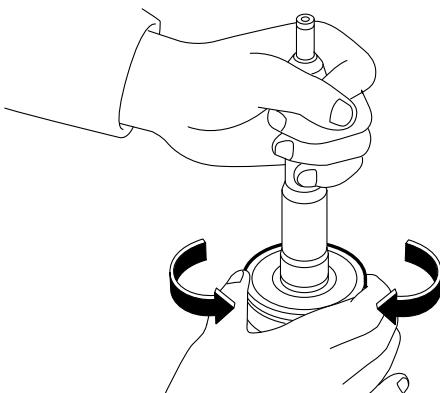


MT-10399

5. Check the input shaft bearing.

- (1) Check that the input shaft bearing rotates smoothly.

ZC-6**



MT-10400

- (2) If defective, replace the input shaft bearing with a new one.

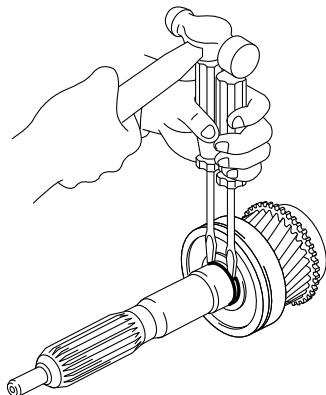
6. Remove the input shaft bearing.

- (1) Remove the snap ring.

Caution:

Make sure the snap ring does not pop out.

ZC-6**

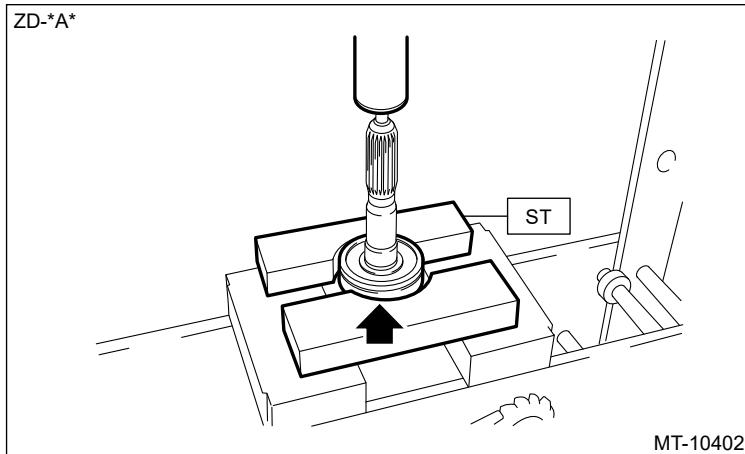


MT-10401

- (2) Using the ST and a press, remove the input shaft bearing.

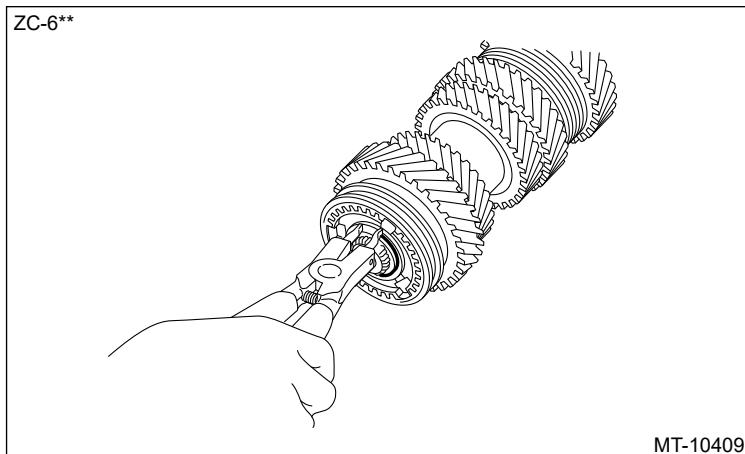
Preparation tool:

ST: REMOVER (899714110)



2. OUTPUT SHAFT

- 1.** Remove the reverse gear.
 (1) Remove the snap ring.

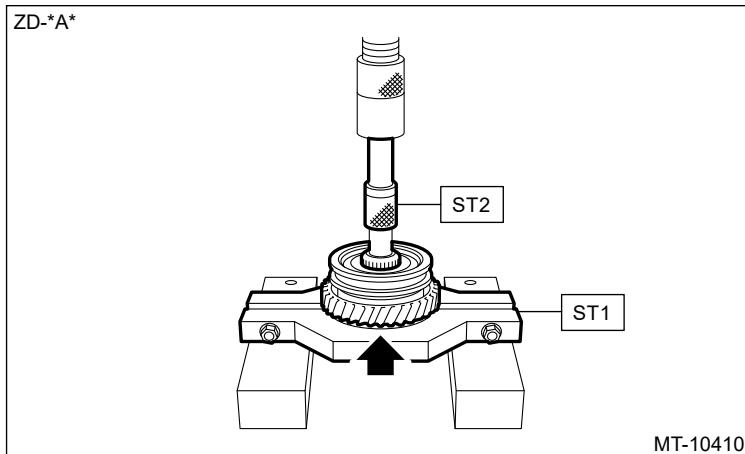


- (2) Use the ST1, ST2, and a press to remove the clutch hub No. 3, hub sleeve No. 3, reverse gear, synchronizer ring No. 3, and reverse gear bearing as a unit.

Preparation tool:

ST1: REMOVER (498077300)

ST2: REMOVER (899864100)



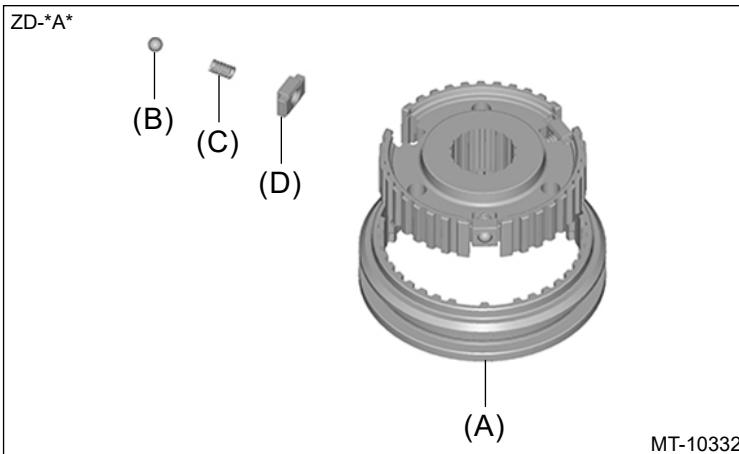
- 2.** Remove the hub sleeve No. 3 (A), and then remove the ball (B), synchromesh shifting key spring No. 1 (C), and synchromesh shifting key No. 1 (D).

Caution:

- Use a cloth to keep the synchromesh shifting key No. 1, synchromesh shifting key spring No. 1, and ball from popping out.
- Be careful not to deform the synchromesh shifting key spring No. 1.
- Check the direction of the parts before removing them.

Note:

Make sure not to change the assembly positions for the hub sleeve No. 3 and synchromesh shifting key No. 1.



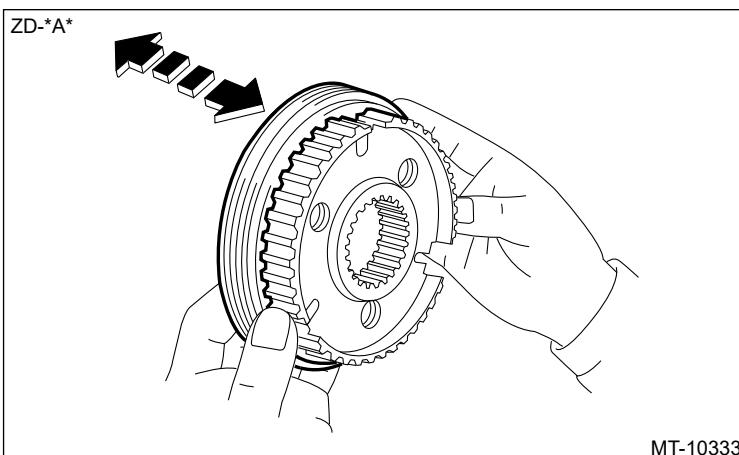
- 3.** Check the hub sleeve No. 3.

- (1) Check the end of the spline gear of the hub sleeve No. 3.

If it is worn, replace the hub sleeve No. 3 with a new one.

- (2) Install the hub sleeve No. 3 to the clutch hub No. 3, and check that the parts slide smoothly.

If they do not slide smoothly, replace the hub sleeve No. 3 and the clutch hub No. 3 with new ones.

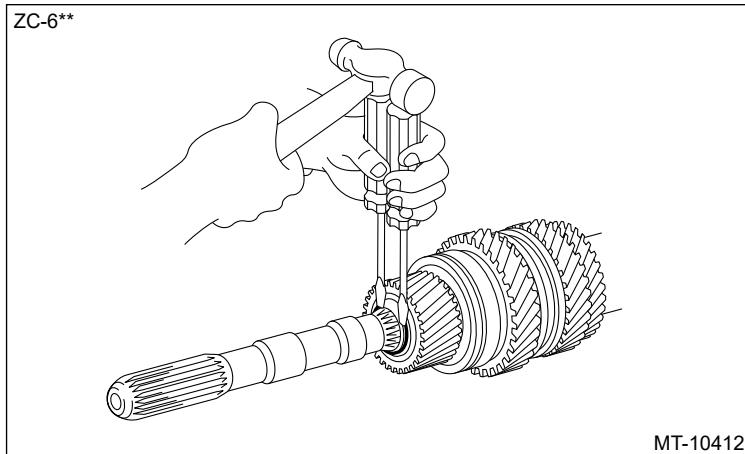


- 4.** Remove the 6th gear.

- (1) Remove the snap ring.

Caution:

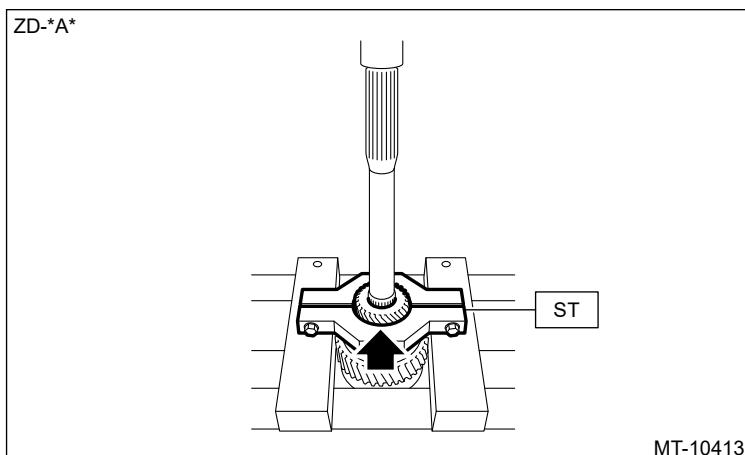
Make sure the snap ring does not pop out.



(2) Remove the 6th gear using the ST and a press.

Preparation tool:

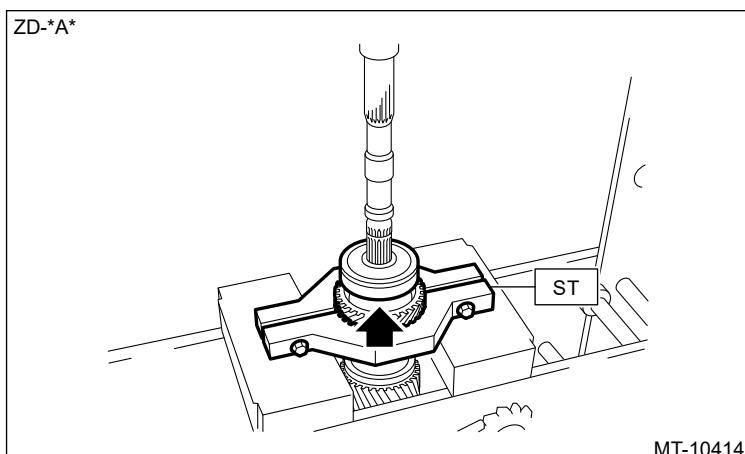
ST: REMOVER (18752AA010)



5. Use the ST and a press to remove the output shaft bearing, 1st gear, 1st gear bearing inner race, 1st gear needle roller bearing, and 1st shift restrict ball as a unit.

Preparation tool:

ST: REMOVER (18722AA000)

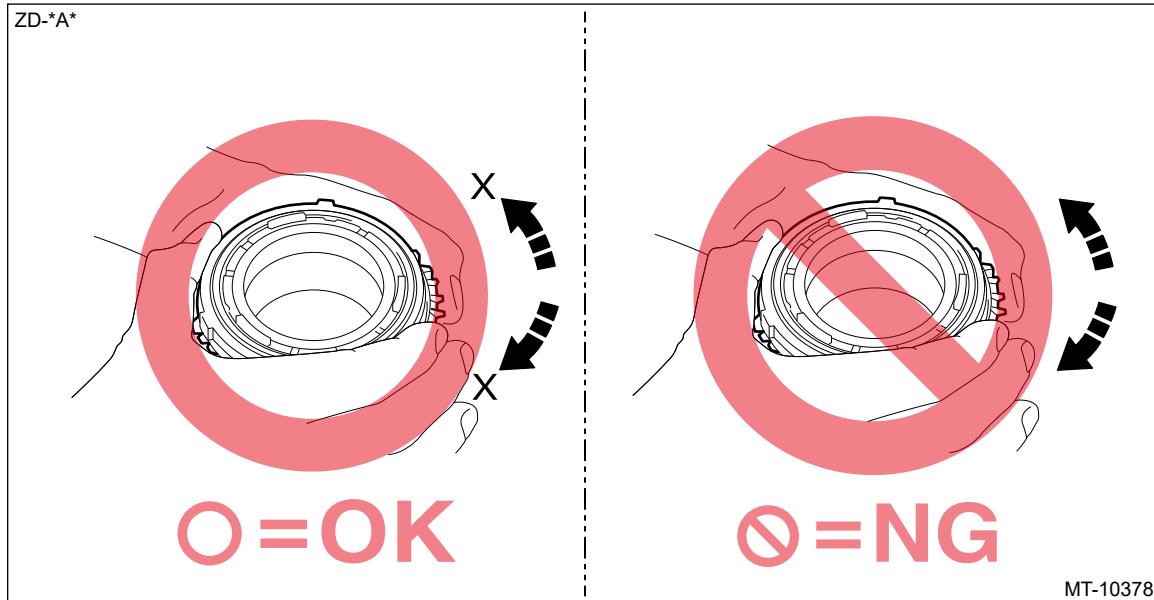


6. Remove the synchronizer ring set No. 1. (1st gear side)

- (1) Apply transmission gear oil to the cone portion of the 1st gear and to the synchronizer ring set No. 1.

(2) Press the synchronizer ring set No. 1 against the 1st gear with your hand and perform the following checks.

1) Confirm that the parts do not turn in the rotational directions.

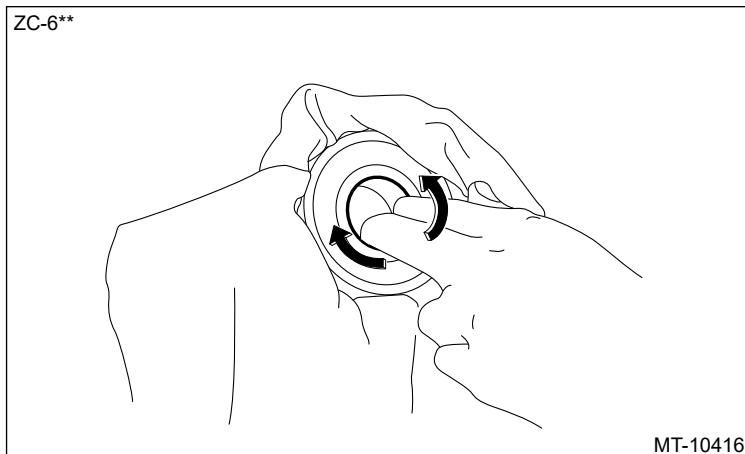


2) If they do, replace the synchronizer ring set No. 1 with a new one.

(3) Remove the synchronizer ring set No. 1 from the 1st gear.

7. Check the output shaft bearing.

(1) Check that the output shaft bearing rotates smoothly.

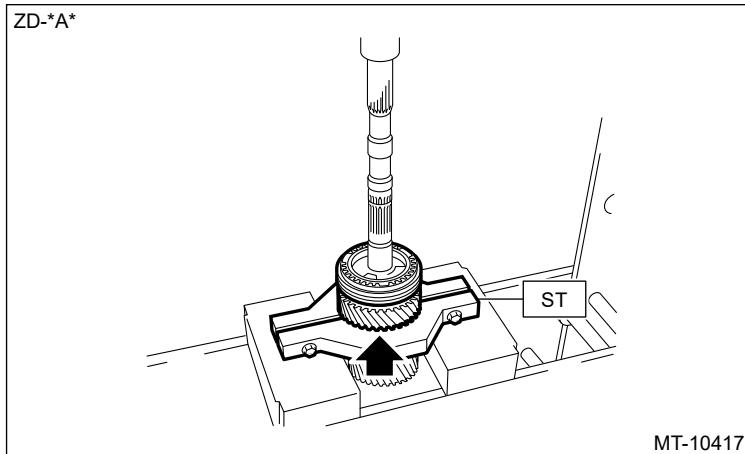


(2) If defective, replace the output shaft bearing with a new one.

8. Use the ST and a press to remove the thrust bearing, 2nd gear, clutch hub No. 1, hub sleeve No. 1, and 2nd gear needle roller bearing as a unit.

Preparation tool:

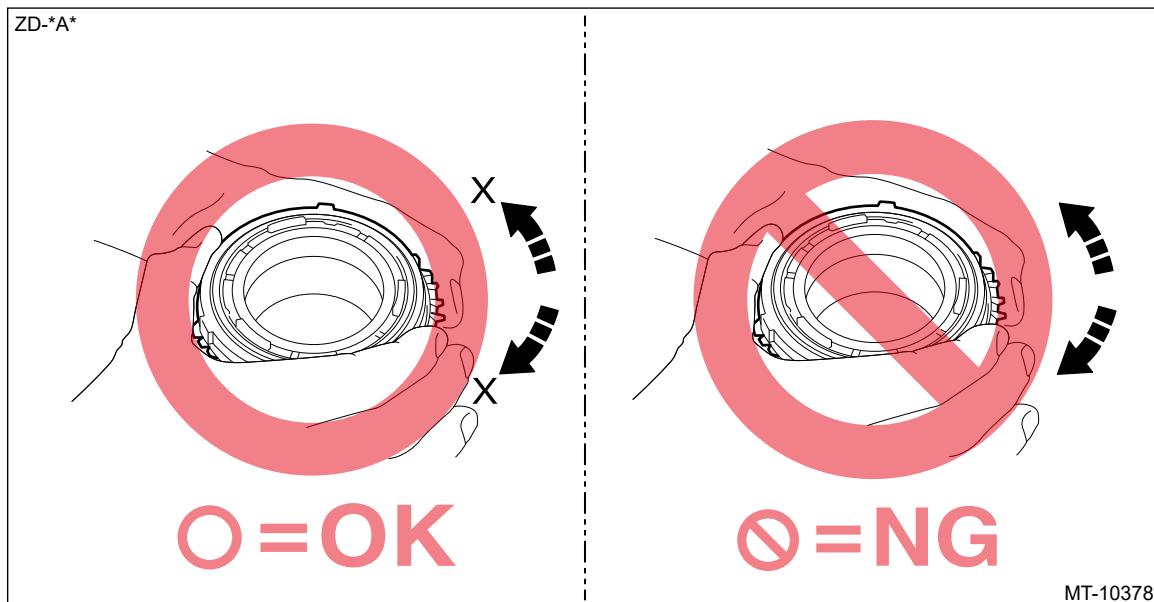
ST: REMOVER (18722AA000)



9. Remove the synchronizer ring set No. 1. (2nd gear side)

- (1) Apply transmission gear oil to the cone portion of the 2nd gear and to the synchronizer ring set No. 1.
- (2) Press the synchronizer ring set No. 1 against the 2nd gear with your hand and perform the following checks.

1) Confirm that the parts do not turn in the rotational directions.



2) If they do, replace the synchronizer ring set No. 1 with a new one.

(3) Remove the synchronizer ring set No. 1 from the 2nd gear.

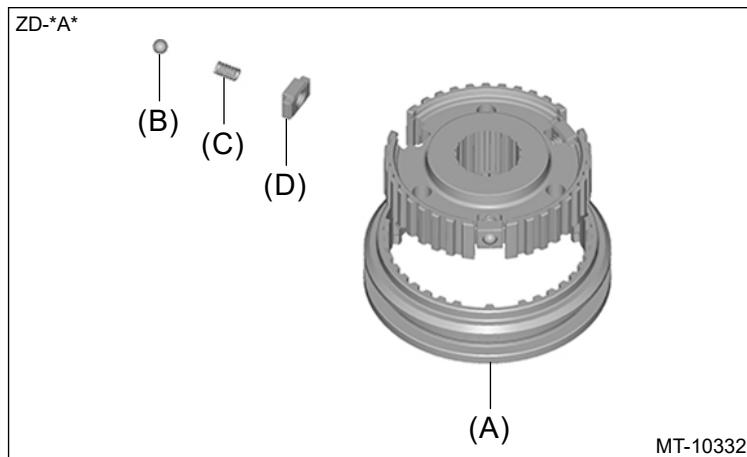
10. Remove the hub sleeve No. 1 (A), and then remove the ball (B), synchromesh shifting key spring No. 1 (C), and synchromesh shifting key No. 1 (D).

Caution:

- Use a cloth to keep the synchromesh shifting key No. 1, synchromesh shifting key spring No. 1, and ball from popping out.
- Be careful not to deform the synchromesh shifting key spring No. 1.
- Check the direction of the parts before removing them.

Note:

Make sure not to change the assembly positions for the hub sleeve No. 1 and synchromesh shifting key No. 1.



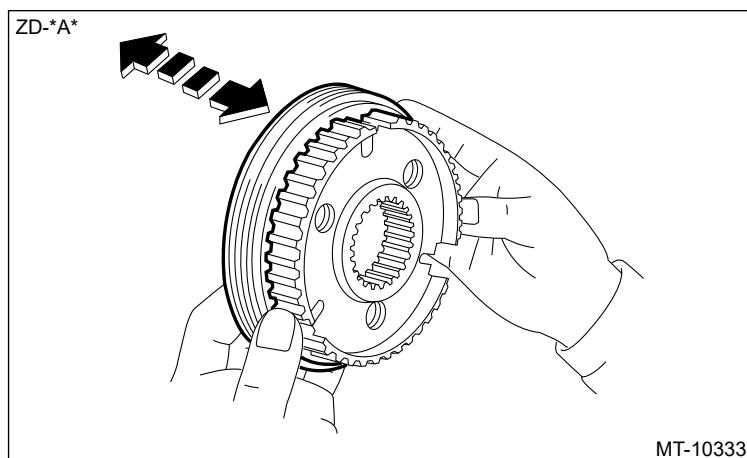
11. Check the hub sleeve No. 1.

(1) Check the end of the spline gear of the hub sleeve No. 1.

If it is worn, replace the hub sleeve No. 1 with a new one.

(2) Install the hub sleeve No. 1 to the clutch hub No. 1, and check that the parts slide smoothly.

If they do not slide smoothly, replace the hub sleeve No. 1 and the clutch hub No. 1 with new ones.



MANUAL TRANSMISSION > Main Shaft

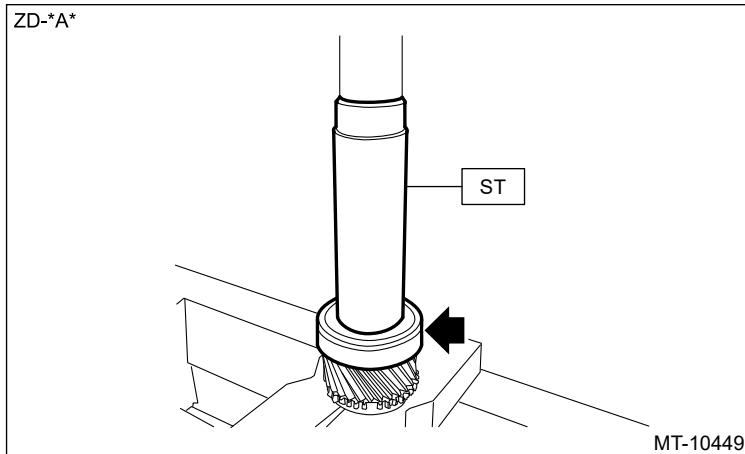
ASSEMBLY

1. INPUT SHAFT

1. Using the ST and a press, install the input shaft bearing.

Preparation tool:

ST: EXTENSION DRIVE SHAFT (927130000)



2. Select the snap ring.

- (1) Select a suitable snap ring so that the clearance "C" between the input shaft bearing and snap ring is within the specified value.

Note:

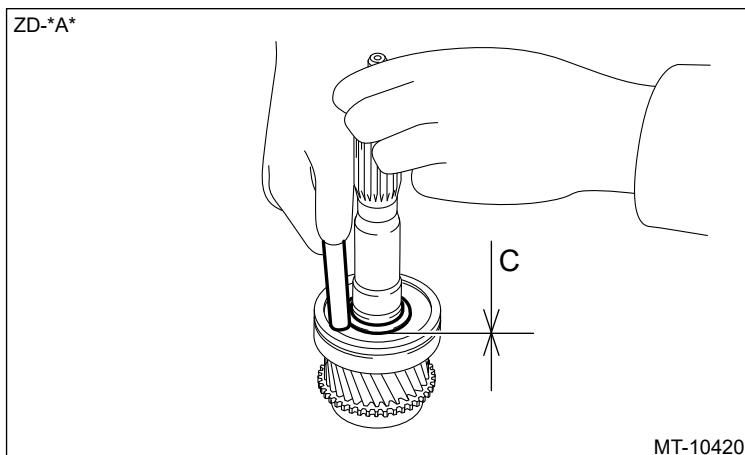
The snap ring is a non-reusable part.

Specification:

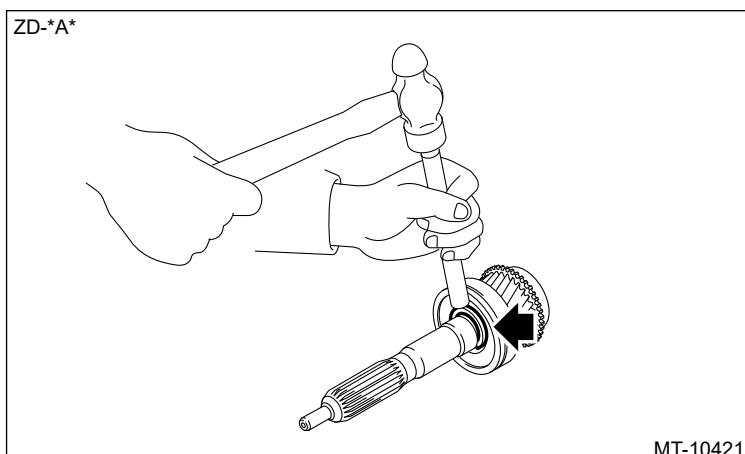
0 – 0.1 mm (0 – 0.004 in)

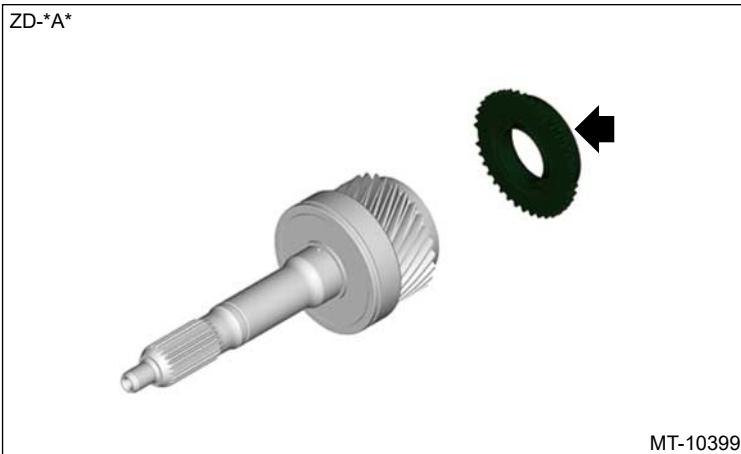
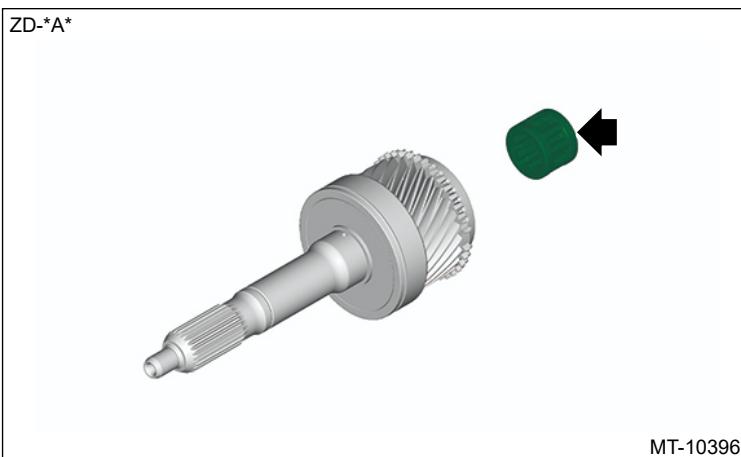
Service limit:

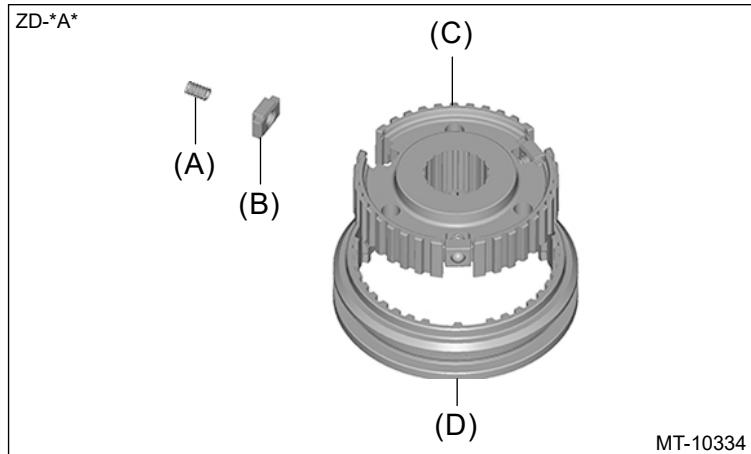
0.1 mm (0.004 in)



- (2) Install the selected snap ring.



3. Install the synchronizer ring No. 2.**Note:****Apply transmission gear oil to the synchronizer ring No. 2.****4. Install the needle roller bearing.****Note:****Apply transmission gear oil to the needle roller bearing.****2. OUTPUT SHAFT****1. Set the synchromesh shifting key spring No. 1 (A) and synchromesh shifting key No. 1 (B) to the clutch hub No. 1 (C), and install the hub sleeve No. 1 (D).****Note:****Make sure not to change the assembly positions for the hub sleeve No. 1 and synchromesh shifting key No. 1.**



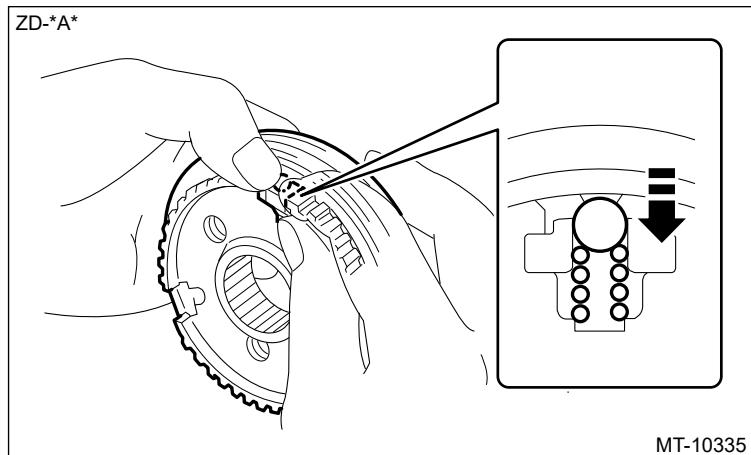
- 2.** Install the ball while pressing the synchromesh shifting key spring No. 1.

Caution:

Use vaseline and make sure the ball does not pop out.

Note:

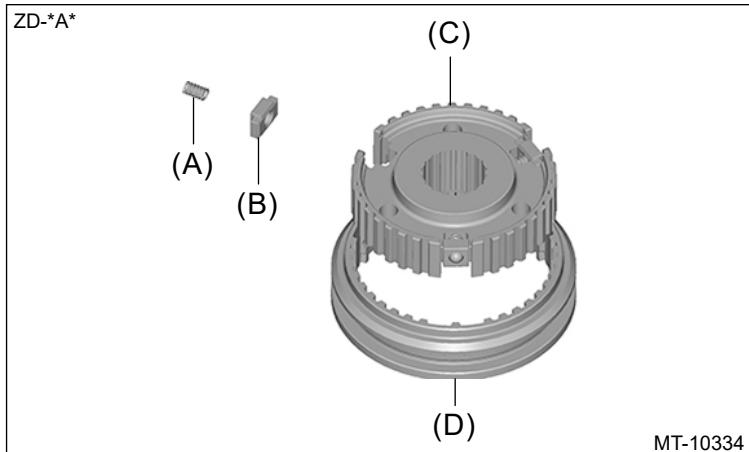
- **Apply transmission gear oil to the sliding area of the clutch hub No. 1.**
- **Secure the synchromesh shifting key spring No. 1.**



- 3.** Set the synchromesh shifting key spring No. 1 (A) and synchromesh shifting key No. 1 (B) to the clutch hub No. 3 (C), and install the hub sleeve No. 3 (D).

Note:

Make sure not to change the assembly positions for the hub sleeve No. 3 and synchromesh shifting key No. 1.



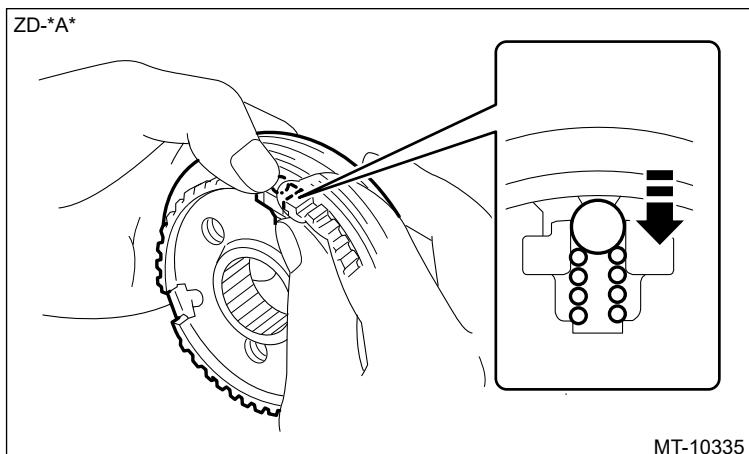
- Install the ball while pressing the synchronesh shifting key spring No. 1.

Caution:

Use vaseline and make sure the ball does not pop out.

Note:

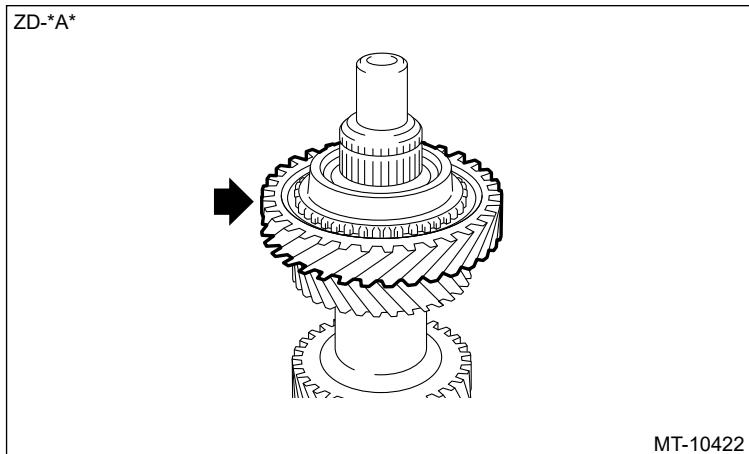
- Apply transmission gear oil to the sliding area of the clutch hub No. 3.**
- Secure the synchronesh shifting key spring No. 1.**



- Attach the reverse gear and reverse gear bearing.

Note:

Apply transmission gear oil to the reverse gear and reverse gear bearing.



6. Install the clutch hub No. 3.

- (1) Install the synchronizer ring No. 3 to the reverse gear.
- (2) Install the clutch hub No. 3 using the ST1, ST2, ST3, and a press.

Preparation tool:

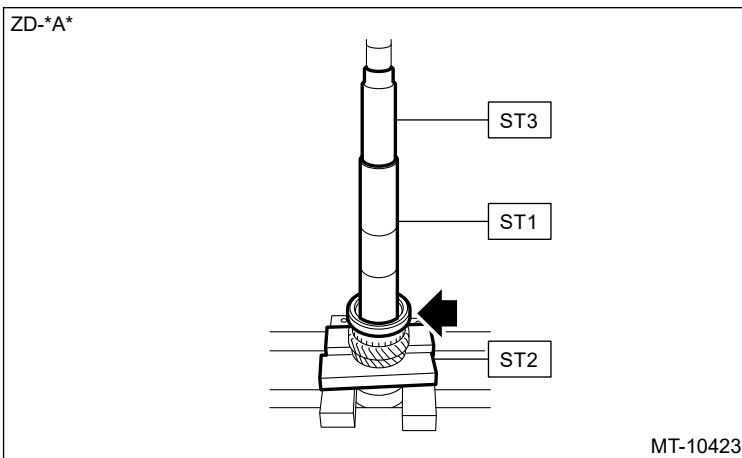
ST1: BUSHING 1-2 INSTALLER (499277100)

ST2: REMOVER (899714110)

ST3: EXTENSION DRIVE SHAFT (927130000)

Caution:

After the installation, check that the synchronizer ring No. 3 slides properly.

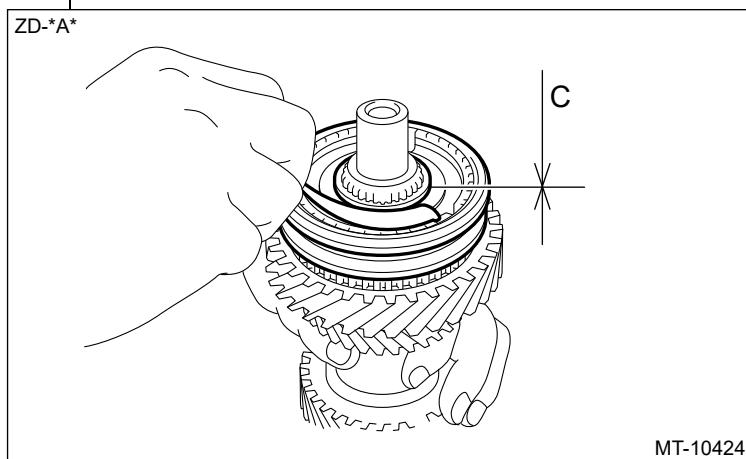


7. Select the snap ring.

- (1) Select a suitable snap ring so that the clearance "C" between the clutch hub No. 3 and snap ring is within the specified value.

Note:

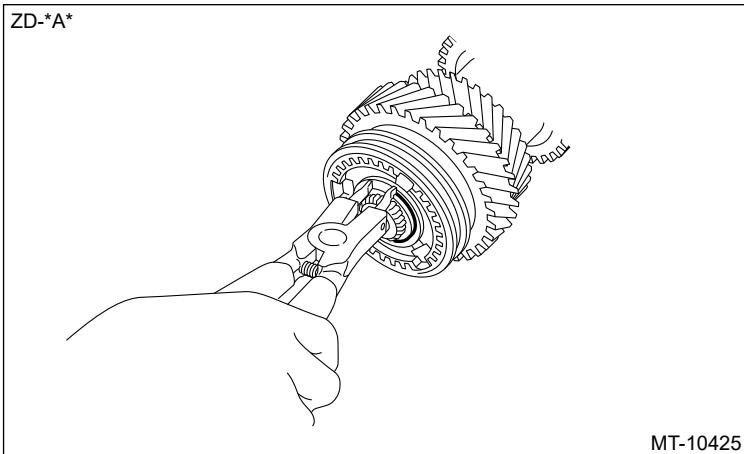
- Select the thickest one that can be installed.
- The snap ring is a non-reusable part.



Specification:

0 – 0.1 mm (0 – 0.004 in)

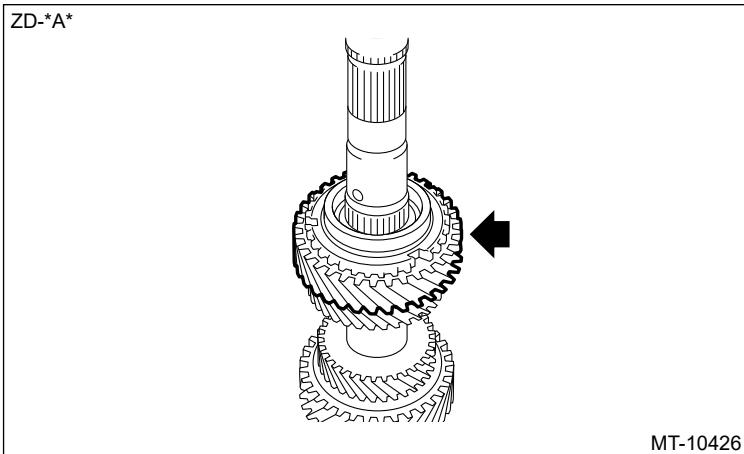
- (2) Install the selected snap ring.



8. Install the thrust bearing, 2nd gear needle roller bearing, and 2nd gear.

Note:

Apply transmission gear oil to the thrust bearing, 2nd gear needle roller bearing, and 2nd gear.



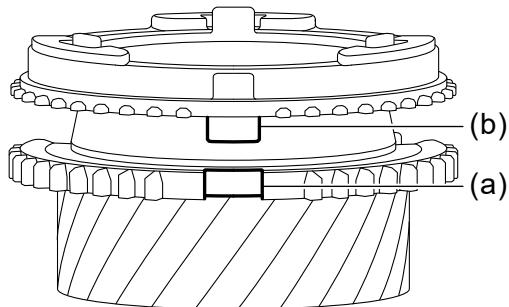
9. Install the clutch hub No. 1.

- (1) Install the synchronizer ring set No. 1 of the 2nd gear.

Note:

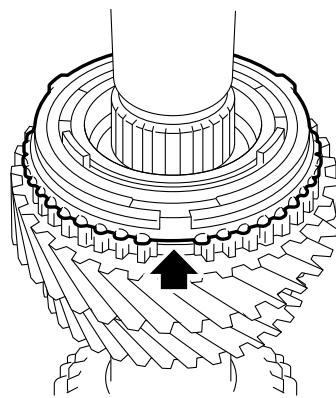
- Align the centering claw (b) with the gear groove (a).
- Align the inner ring claw (d) with the outer ring groove (c).

ZD-*A*



MT-10381

ZC-6**



MT-10427

(2) Install the clutch hub No. 1 using the ST1, ST2, ST3, and a press.

Caution:

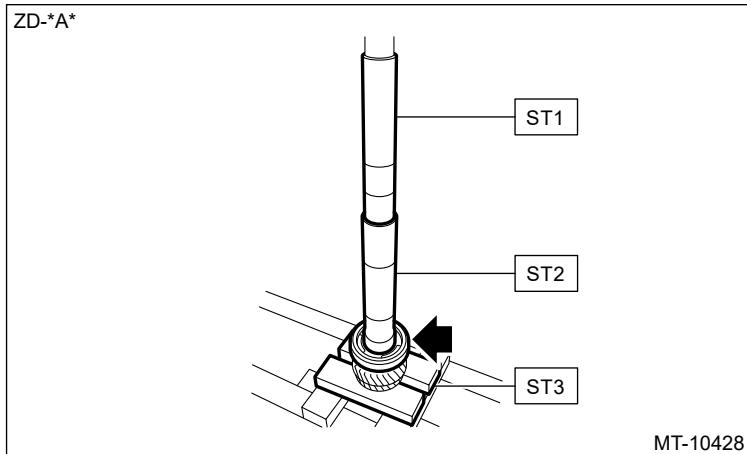
After the installation, check that the synchronizer ring set No. 1 slides properly.

Preparation tool:

ST1: INSTALLER (499277000)

ST2: BUSHING 1-2 INSTALLER (499277100)

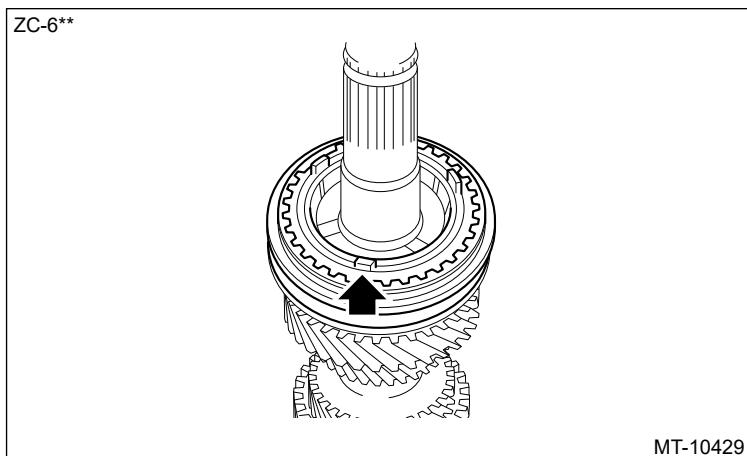
ST3: REMOVER (899714110)



(3) Install the synchronizer ring set No. 1 of the 1st gear.

Note:

- Align the inner ring claw with the outer ring groove.
- Align the outer ring claw with the hub groove.

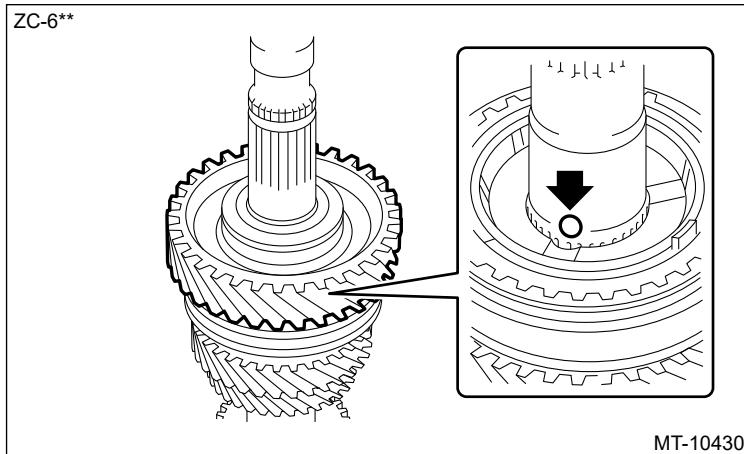


10. Install the 1st gear.

(1) Install the 1st shift restrict ball, 1st gear, 1st gear needle roller bearing, and 1st gear bearing inner race.

Note:

- Apply transmission gear oil to the 1st gear needle roller bearing and 1st gear.
- Align the centering claw with the gear groove.
- Install the 1st shift restrict ball to the ball groove of the output shaft.



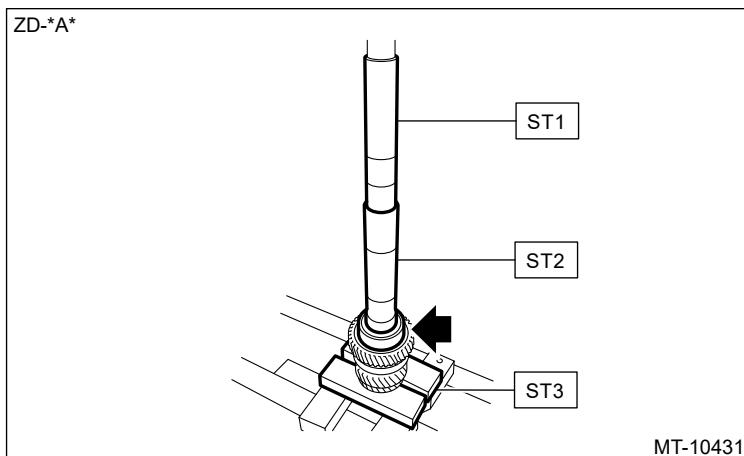
11. Install the output shaft bearing using the ST1, ST2, ST3, and a press.

Preparation tool:

ST1: INSTALLER (499277000)

ST2: BUSHING 1-2 INSTALLER (499277100)

ST3: REMOVER (899714110)



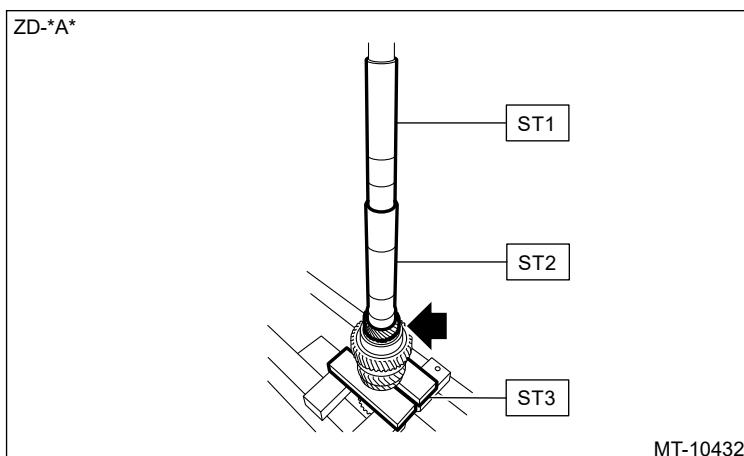
12. Install the 6th gear using the ST1, ST2, ST3, and a press.

Preparation tool:

ST1: INSTALLER (499277000)

ST2: BUSHING 1-2 INSTALLER (499277100)

ST3: REMOVER (899714110)



13. Select the snap ring.

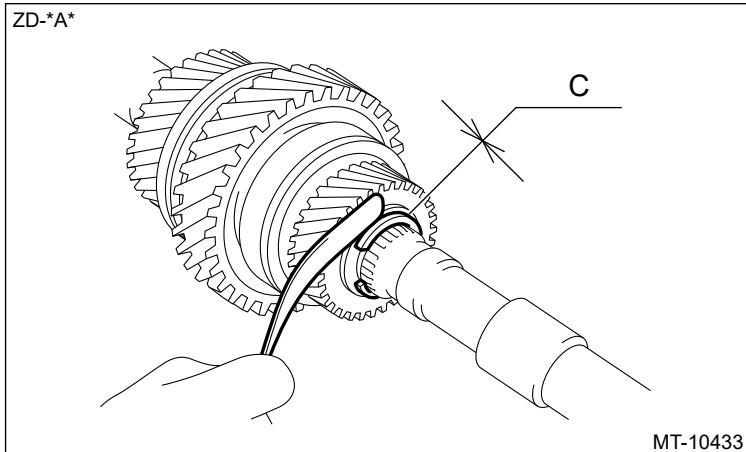
- (1) Select a suitable snap ring so that the clearance "C" between the 6th gear and snap ring is within the specified value.

Note:

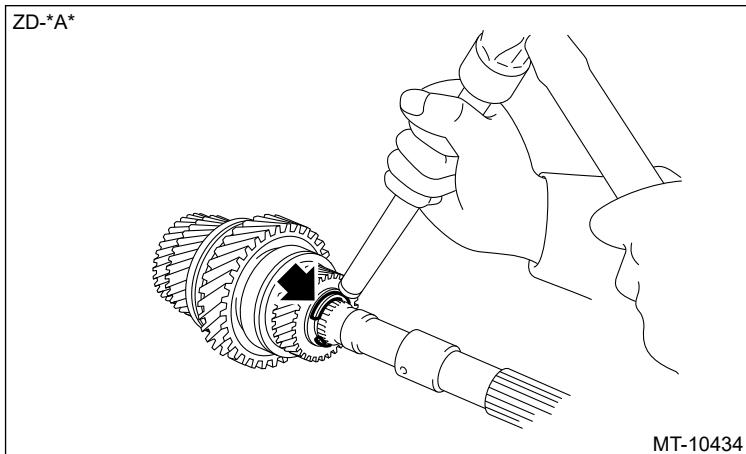
- **Select the thickest one that can be installed.**
- **The snap ring is a non-reusable part.**

Specification:

0 – 0.11 mm (0 – 0.004 in)



- (2) Install the selected snap ring.



MANUAL TRANSMISSION > Main Shaft

INSPECTION

Check the following parts and replace them if you find any of the issues described below.

1. NEEDLE ROLLER BEARING

1. Check the needle roller bearing for abnormal wear.
2. Check that the needle roller bearing does not have deformation, cracks, and any other damage.

2. SYNCHRONIZER RING

1. Check the synchronizer ring for abnormal wear.

2. Check that the synchronizer ring does not have deformation, cracks, and any other damage.

3. INPUT SHAFT

1. Check the input shaft for abnormal wear.
2. Check that the input shaft does not have deformation, cracks, and any other damage.

4. REVERSE GEAR BEARING

1. Check the reverse gear bearing for abnormal wear.
2. Check that the reverse gear bearing does not have deformation, cracks, and any other damage.

5. REVERSE GEAR

1. Check the reverse gear for abnormal wear.
2. Check that the reverse gear does not have deformation, cracks, and any other damage.

6. 6TH GEAR

1. Check the 6th gear for abnormal wear.
2. Check that the 6th gear does not have deformation, cracks, and any other damage.

7. 1ST GEAR

1. Check the 1st gear for abnormal wear.
2. Check that the 1st gear does not have deformation, cracks, and any other damage.

8. 1ST GEAR NEEDLE ROLLER BEARING

1. Check the 1st gear needle roller bearing for abnormal wear.
2. Check that the 1st gear needle roller bearing does not have deformation, cracks, and any other damage.

9. 2ND GEAR

1. Check the 2nd gear for abnormal wear.
2. Check that the 2nd gear shift shaft does not have deformation, cracks, and any other damage.

10. 2ND GEAR NEEDLE ROLLER BEARING

1. Check the 2nd gear needle roller bearing for abnormal wear.
2. Check that the 2nd gear needle roller bearing does not have deformation, cracks, and any other damage.

11. HUB SLEEVE

1. Check the hub sleeve for abnormal wear.
2. Check that the hub sleeve does not have deformation, cracks, and any other damage.

12. CLUTCH HUB

1. Check the clutch hub for abnormal wear.
2. Check that the clutch hub does not have deformation, cracks, and any other damage.

13. OUTPUT SHAFT

- 1.** Check the output shaft for abnormal wear.
- 2.** Check that the output shaft does not have deformation, cracks, and any other damage.

14. OTHER

- 1.** Check each part for excessive wear.
- 2.** Check that there is no deformation, cracks or other damages.
- 3.** Check the bearing for smooth rotation.
- 4.** Check the bearing for looseness.

MANUAL TRANSMISSION > Symptoms and causes

INSPECTION

Caution:

If noise occurs, identify the cause before work.

Symptoms	Problem parts etc.	Possible cause
Noise is emitted. Note: If the maximum vehicle speed recorded in the control operation history exceeds 226 km/h (140 MPH), they vehicle may have been operated at an abnormally high speed. Check if the vehicle has been modified.	Gear	Faulty gear Note: Check the control operation history.  Ref. to ENGINE (DIAGNOSTICS). (H4DO)>Work Support>OPERATION.
Hard to shift, or does not shift. (At 1st ↔ 2nd operation)	Stopper	Improper stopper adjustment
Hard to shift, or does not shift. Note: If the maximum vehicle speed recorded in the control operation history exceeds 226 km/h (140 MPH), they vehicle may have been operated at an abnormally high speed. Check if the vehicle has been modified.	Synchronizer ring set	Faulty synchronizer ring set Note: Check the control operation history.  Ref. to ENGINE (DIAGNOSTICS). (H4DO)>Work Support>OPERATION.
Jumps to next gear.	Shift key spring	Faulty shift key spring Note: Check the control operation history.  Ref. to ENGINE (DIAGNOSTICS). (H4DO)>Work Support>OPERATION.
	Locking ball spring	Faulty locking ball spring
	Shift fork	Faulty shift fork
	Gear	Faulty gear

Symptoms	Problem parts etc.	Possible cause
<p>Note: If the maximum vehicle speed recorded in the control operation history exceeds 226 km/h (140 MPH), they vehicle may have been operated at an abnormally high speed. Check if the vehicle has been modified.</p>		<p>Note: Check the control operation history.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Work Support>OPERATION.</p>
	Bearing	<p>Faulty bearing</p> <p>Note: Check the control operation history.  Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Work Support>OPERATION.</p>